NETWORK WORLD
The Newsweekly of User Networking Strategies
Volume 6, Number 43
An IDG Communications Publication
October 30, 1989

IBM makes big pitch for factory nets

By Susan Breidenbach
West Coast Bureau Chief

WHITE PLAINS, N.Y. — IBM last week made the most comprehensive computer-integrated manufacturing (CIM) announcement in its history, introducing more than 50 hardware and software products and its CIM Architecture for integrating IBM systems into multivendor factory networks.

The announcements include IBM's first Manufacturing Automation Protocol 3.0 products — Manufacturing Messaging Services (MMS) software for the VM and OS/2 environments. Also unveiled was a controller that links factory nets to IBM mainframes and tools for building manufacturing applications.

The CIM Architecture, based on IBM's Systems Application Architecture (SAA) and AIX, IBM's version of the Unix operating system, is designed to facilitate the integration of factory and business applications by providing a common data repository for information collected by both IBM and non-IBM systems in the factory environment.

"This is definitely the most significant manufacturing announcement IBM has made in my memory," said Keith Belton, director of the manufacturing automation planning service of The Yankee Group, a market research

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PHOTO ©1989 STEVEN BORNS

AT&T executives Peter Fenner and Al Basey detail the company's SONET products at Bell Laboratories. See story, page 6.

Kendall Co. routes APPN traffic over IBM info net

Migration of data to IBM's Information Network has slashed network response time by 50%.

By Paul Desmond
Senior Writer

BOSTON — After a yearlong beta test, the Kendall Co. has decided to upgrade its minicomputers to support IBM's Advanced Peer-to-Peer Networking (APPN) architecture and migrate the leased-line net to IBM's Information Network (IIN).

The IIN transport network, in concert with the dynamic adaptive routing capabilities of APPN, will increase Kendall's chances of weathering a net disaster and slash network response time by up to 50%, the company said.

Kendall, a health care product manufacturer based here, is configuring its Application System/400s to support APPN as a requirement for linking to IIN, IBM's mainframe-based value-added network.

Kendall currently has four AS/400s directly linked to IIN and others linked indirectly through these nodes, making it the first IIN customer to use the network to support mid-range computers. IBM announced IIN support for minicomputers just last month.

The migration to IIN facilities, scheduled to be complete in February, is replacing 9.6K bit/sec leased lines used to link 30

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FCC won't prohibit AT&T off-tariff deals

Carrier bills ruling as big win for custom net tariffs, says it clears way to compete better for users.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — AT&T claimed victory on two major regulatory fronts last week when the Federal Communications Commission refused to prohibit AT&T from offering custom network deals under Tariffs 12 and 15.

Tariff 12, which allows AT&T to offer package deals at discounted rates, had previously been endorsed by the FCC but was being reexamined in response to objections filed by the Independent Data Communications Manufacturers Association (IDCMA) and rival carrier Williams Telecommunications Group, Inc. (WTG).

See "Brokerages unsure about Tariff 12," page 2.

Tariff 15, which allows AT&T to offer services at below-tariff prices for individual customers in response to similar offers from competitors, had been under investigation by the FCC for a year.

Joseph Nacchio, vice-president of business communications services at AT&T, said the FCC's decision cleared the way for AT&T to compete aggressively for large customers. He predicted that the carrier would have at least 50 Tariff 12 customers by the end of next year and that there could also be a number of Tariff 15 filings.

In its decision last week, the FCC upheld an April ruling endorsing Tariff 12 and dismissed complaints from IDCMA and

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NCR ready to unveil Tower NetWare line

By Laura DiDio
Senior Editor

NEW YORK — NCR Corp. and Novell, Inc. are scheduled to introduce tomorrow a version of the Unix-based Portable NetWare local network operating system to run on NCR's family of Tower supermicrocomputers.

Networks based on the product, NCR Tower NetWare, will link Unix-based supermicrocomputers and support DOS- and OS/2-based personal computers, as well as Apple Computer, Inc. Macintoshes running NetWare for Macintosh software.

"Tower NetWare represents an economical and efficient means of bringing the power and multiprocessing capabilities of Unix to NetWare PC LAN users," claimed John Lynch, NCR's director of Tower and personal computer marketing.

NCR Tower NetWare is scheduled to ship next month, which

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NETLINE

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DEC GOES AFTER the mainframe market with the new high-end VAX 9000. Page 2.

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BIG BLUE'S new security products include a new version of RACF. Page 4.

AT&T FILES Tariff 16 for the state of Pennsylvania. Page 60.

NEWSPAPER

FEATURE

Security issues impede acceptance of X.500

By Daniel Blum
Special to Network World

The CCITT/ISO X.500 Directory Services standard is in the grip of a mid-life crisis. Although it has gained some measure of acceptance in the academic and research communities, it has been slow to emerge from its ivory tower and take root in the world of large commercial and government users.

The delay seems to be caused by problems with security aspects of the standard and by conflicting expectations of what the standard is supposed to deliver.

X.500 is a directory service that supports the X.400 Message Handling System (MHS) and other Open Systems Interconnection applications by storing their presentation addresses and information about users. The International Standards Organization and the

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Brokerages, unsure about Tariff 12, opt for MCI net

Drexel Burnham Lambert, Stuart-James decide to go with MCI rather than risk FCC tariff ruling.

By Barton Crockett
Senior Editor

Two financial brokerages last week announced they have spurned AT&T Tariff 12 bids in favor of MCI Communications Corp. proposals, in part because of the long-standing legal uncertainty clouding the custom network offering.

New York-based Drexel Burnham Lambert, Inc. awarded MCI a three-year, $15 million contract; and Stuart-James Co. of Denver signed a multiyear, $27 million deal with the carrier. The exact duration of the Stuart-James contract was not revealed.

Drexel Burnham Lambert contracted MCI to supply nearly all of its voice services, including a 15-location Vnet virtual network, as well as 800 and calling card services for its domestic offices. In the past, the brokerage split its voice services between MCI and AT&T.

Stuart-James handed MCI virtually all of its voice and data services. Until now, the brokerage purchased most of its telecommunications services from AT&T.

Stuart-James' voice services will include a 50-location Vnet and 800 services. The user will also rely on dedicated T-1 connections that support Vnet voice traffic to carry data between the firm's 49 regional offices and its Denver data center.

Data traffic routed across the net will consist mainly of buy-and-sell orders and trade confirmations.

Previously, Stuart-James used dedicated T-1s in about 70% of its offices to carry outgoing voice

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DEC nudges into IBM mart with intro of mainframe

VAX 9000 may extend DECnet in data centers.

By Jim Brown
Senior Editor

BOSTON — Digital Equipment Corp. last week introduced its long-awaited mainframe, a machine that will enable the company to grow DECnet networks into corporate data centers, long the stronghold of IBM.

The new VAX 9000 can be used as a giant network server capable of supporting computation-intensive applications in a DECnet network or act as a data base server supporting high-volume transaction processing, the typical domain of IBM mainframes.

"DEC is set here to play seriously in the high-end transaction processing arena," said Robert Cameron, associate director of Northeast research in the Boxborough, Mass., office of Dataquest, Inc., a market research firm.

The VAX 9000, which is scheduled for shipment next spring, represents DEC's second stab at the mainframe market. DEC's first mainframes, the DEC System 10 and System 20, were intro-

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Users reexamine disaster strategy after Calif. quake

By Barton Crockett
Senior Editor

SAN FRANCISCO — Bay Area network operations have largely returned to normal, allowing network managers to mull over lessons learned from the devastating earthquake here.

Five of 13 major network users that had cut over network operations to emergency backup centers halted their recovery efforts when it was learned that damage to their data and net centers was not as extensive as initially feared.

Comdisco Disaster Recovery Services, Inc. and SunGard Recovery Services, the disaster recovery firms providing the backup sites, declined to identify the users.

Users that implemented full recoveries found their stay to be relatively short. At press time, all of SunGard's facilities were vacant and all but two users had left Comdisco's.

"When the power came back, most users found they could return to their data centers," said John Jackson, a Comdisco executive vice-president. "With the Hinsdale [Ill.] central office fire, customers were with us [much longer]."

Despite relatively little permanent damage, some users said they learned important lessons.

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Briefs

AT&T countersues MCI over ads. The increasingly bitter advertising battle between MCI Communications Corp. and AT&T escalated last week when AT&T filed a countersuit against MCI in the U.S. District Court for the District of Columbia. Both companies claim their rivals' ads are false and deceptive. AT&T is seeking damages equal to business it has lost; it did not specify an amount.

Net management tag team. The Corporation for Open Systems International (COS), the Open Systems Interconnection/Network Management (OSI/NM) Forum and the Belgium-based Standards Promotion and Application Group (SPAG) last week said they will jointly develop OSI conformance test tools for net management products. The tools will test for conformance to OSI transport protocols running over IEEE 802.3 and X.25 networks; conformance to Session, Presentation, Association Control Service Element (ACSE) protocols and Common Management Information Protocol; and OSI/NM Forum-defined Objects and Messages within the network management protocol. The test products are expected to be available in late 1990 and will be incorporated in the COS-SPAG Integrated Tool Set.

Unisys' earnings nosedive. Unisys Corp.'s earnings plummeted last week, as the company posted a $648.2 million loss for its third quarter ended Sept. 30, down drastically from earnings of $151 million for the corresponding quarter last year. The Blue Bell, Pa.-based company's revenue for the third quarter was $2.4 billion, up 4% over the $2.3 billion recorded the year before. The disappointing earnings reflect the company's previously announced restructuring, as well as tough competition in the company's computer and defense businesses, said Michael Blumenthal, Unisys chairman and chief executive officer.

An enterprising idea. The Society of Manufacturing Engineers (SME) last week said it is planning a second network showcase event, dubbed Enterprise Networking Event '91, to address key network standards developments, information technologies, testing issues and the cost-justification of network projects. The event committee includes representatives from the Pentagon, Hewlett-Packard Co., Hughes Aircraft Co., Deere Technical Services, the National Institute of Science and Technology, and the U.S. Navy. The show will be held May 21 to 23 in Baltimore.

AT&T boosts switch software. AT&T Network Systems Group last week announced new software for its flagship 5ESS central office switch that enables it to make Signaling System 7 and Integrated Services Digital Network Primary Rate Interface connections to toll switches such as the 4ESS. AT&T said the 5E6 software, which will be available next year, will increase the switch's call-handling capacity by 33%, to a maximum of 350,000. The software also enables users of analog dial-up computer networks to program the switch to accept calls only from a predetermined list of phone numbers.

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(508) 820-2543

Second-class postage paid at Framingham, MA, and additional mailing offices. *Network World* (USPS 735-730) is published weekly, except for a single combined issue for the last week in December and the first week in January by Network World Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171.

To apply for a free subscription, complete and sign the qualification card in this issue or write *Network World* at the address below. No subscriptions accepted without complete identification of subscriber's name, job function, company or organization. Based on information supplied, the publisher reserves the right to reject non-qualified requests. Subscriptions: 1-508-620-7760.

Non-qualified subscribers: $3.00 a copy; U.S. — $95 a year; Canada, Central & South America — $110 a year; Europe — $165 a year, all other countries — $245 a year (air mail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin. Please include mailing label appearing on front cover of the publication.

Network World can be purchased on 35mm microfilm through University Microfilm Int., Periodical Entry Dept., 300 Zebb Road, Ann Arbor, Mich. 48106.

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POSTMASTER: Send Change of Address to *Network World,* Box 9172, Framingham, Ma. 01701-9172.

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Which is nothing new to the VINES users who've been enjoying proven 386 performance for over a year. But to those who are still waiting for NetWare to catch up, remember, it's never too late to shift gears.

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See the FAXNeT Form on Page #65

IBM's new release of RACF, other security tools bow

Products provide way to secure network access.

By Tom Smith
New Products Editor

NEW YORK — IBM last week introduced an enhanced version of its Resource Access Control Facility (RACF) mainframe security product and a new family of Transaction Security System products that use the Data Encryption Standard.

The company also announced that, in response to growing concern over computer viruses, it has opened the High Integrity Computing Laboratory at the Thomas J. Watson Research Center in Hawthorne, N.Y.

Enhancements in Version 1 Release 9 of RACF increase the security of MVS and VM operating systems to a B1 level as specified by the Department of Defense, IBM said.

B1 security involves mandatory access controls and the labeling of data as secret, top secret and so on. The product was previously certified at the C2 level.

RACF software enables users to secure a mainframe by providing a way to support user identification and passwords, and to restrict access to resources such as data and specific devices.

The previous RACF release enabled users to decide where and when to use passwords, but it did not provide password control for system operators, remote job entry or local job entry, according to Art Gilbert, manager of secure systems industry support at IBM.

With the new release, RACF assigns passwords to operators as well as to remote and local jobs that dictate what functions users can perform, Gilbert said.

RACF 1.9 also supports multilevel security for the first time, enabling users to label data by confidentiality level or by category, such as personnel, Gilbert explained. Individual users are given clearance for certain labels that include the level and category.

Customers need the newest release of MVS, Version 3 Release

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Quake puts AT&T disaster recovery plan into action

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week said more than 200 customers took advantage of its new 800 Service Assurance Plan and an existing 800 service option to reroute toll-free 800 calls away from California offices knocked out by the recent earthquake there.

In keeping with its 800 Service Assurance Plan, which guarantees customers that 800 calls will be routed to another site or to a recorded message in the event of an outage, AT&T rerouted calls for 120 users, including Citicorp Student Loans, a subsidiary of Citicorp headquartered in Rochester, N.Y., and James River Corp. of Richmond, Va.

AT&T rerouted calls for another 112 customers who subscribe to its optional Command Routing 800 feature, a service that lets users divert calls to multiple locations.

Under the 800 Service Assurance plan, which took effect Oct. 16, AT&T promises customers it will implement a contingency option within an hour if their service is knocked out by a network failure, or premises equipment or access problems.

The options include: temporary provision of 800 Readyline toll-free calling over existing telephone lines on or off the customer's premises; routing 800 calls to a recorded message; or routing the calls to one of three other AT&T 800 services to which the customer subscribes — AT&T 800 Service, 800 Readyline and 800 Megacom.

According to Cliff Holtz, 800 services district marketing manager for AT&T, only 13 customers chose to have calls routed to a recorded announcement.

Exemplary strategies

"I don't think AT&T expected this kind of immediate need for the feature," said Jeff Hefke, telecommunications manager for Citicorp Student Loans. The company, a subsidiary of Citicorp, was among the first in the nation to use AT&T's 800 Service Assurance Plan.

The quake rattled the company's Western regional office in Sacramento, Calif., which handles 3,000 calls a day from people seeking loan application status and alternative means to pay their student loans.

The office, which uses two T-1 1.544M bit/sec lines to access AT&T's Megacom 800, decided it wanted to reroute incoming calls to its Eastern regional customer service center in Rochester, N.Y., rather than having calls blocked.

AT&T rerouted all 800 traffic to the Eastern site within an hour and did not switch the traffic back to the Sacramento office until last Tuesday, Hefke said. "It worked very effectively. I was extremely pleased with the way AT&T handled the situation," he said.

James River, one of the world's largest paper products manufacturers, also put AT&T's 800 Service Assurance Plan to the test. The earthquake rocked the company's Oakland, Calif., customer service center, knocking its Rolm Corp. CBX out of service and damaging its building.

The communications staff and business managers at the company's headquarters in Richmond, Va., decided to have 800 calls to Oakland rerouted to its Orange, Calif., office, said Karen Lobitz, telecommunications manager.

"We identified the 800 numbers we wanted rerouted and the office we wanted them sent to. AT&T got the job done within an hour. It was terrific," Lobitz said.

While the assurance plan was adequate for many users, 112 larger customers with the Command Routing option invoked the service to route calls to multiple locations.

"[One] company said it wanted 50% of its [California-bound] calls sent to one location, 40% to a second site and 10% to a third location," Holtz recalled. The requests were met by AT&T technicians, who changed the routing tables in its 800 data bases.

NCR's Ethernet interface enhances FEP capabilities

By Paul Desmond
Senior Writer

BOSTON — NCR Comten last week unveiled an Ethernet interface that enables its front-end processors to route TCP/IP packets between Ethernets and link TCP/IP and IBM Systems Network Architecture environments.

The products, Comten TCP/IP and Comten Ethernet LAN Interface, process Ethernet and Transmission Control Protocol/Internet Protocol data in an NCR Comten front-end processor, an approach the company said preserves mainframe power and improves network performance.

Comten TCP/IP and Comten Ethernet LAN Interface are separate packages consisting of software and adapter boards that, for the first time, enable users to attach Ethernets directly to NCR Comten's 56X5 and 5620 communications processors and its older 3690 and 3695 models.

When used in tandem, the products enable an NCR Comten

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Woolworth awards MCI $12m pact

By Bob Brown
Senior Editor

NEW YORK — Woolworth Corp. last week said it has awarded MCI Communications Corp. a $12 million, multiyear contract to provide voice and billing services for more than 5,600 domestic corporate and retail sites.

The retailer will use MCI's Vnet virtual network service to support its headquarters, regional merchandise and distribution offices, and district offices.

The company will also use MCI's Corporate Account Services billing program to amalgamate billing for all locations, including its retail stores, which use MCI's Dial "1" services. The contract represents MCI's largest U.S. network account, measured by the number of sites served.

The retailer had tested Vnet since November 1988, and it gave MCI the nod over its previous carrier, US Sprint Communications Co., largely because MCI could offer switched access to Vnet, said William Johnson, Woolworth's director of telecommunications.

Although US Sprint has since introduced switched access to its Virtual Private Network (VPN) service, Johnson said he was also attracted to MCI because of its sophisticated billing capabilities.

AT&T provides switched access to its virtual network offering, but MCI's Vnet was less expensive, Johnson said. "Price is always important, especially in the retail business because you've got to make your numbers," he added.

Before signing on with MCI, Woolworth supported only its largest offices with the US Sprint VPN because switched access was not available for its smaller locations.

When the firm began pilot-testing Vnet, the current VPN sites were the first to be cut over.

Phase 1 of the Vnet project linked 11 regional Woolworth merchandise operation and distribution centers, and its headquarters here, which all had been using dedicated lines to access VPN.

Woolworth sites with heavy communications requirements are using T-1 lines to access Vnet, Johnson said.

The retailer is using three T-1s to tie its headquarters to Vnet, two T-1s at its Harrisburg, Pa., accounting office and two more T-1s at its Milwaukee accounting facility, he said.

In Phase 2 of the project, which kicked off about six weeks ago, MCI provided switched access to Vnet for six smaller regional offices, Johnson said. Previously, these sites used regular Dial "1" switched services.

During Phase 3, some 400 Woolworth district offices, which are responsible for local stores, will be brought onto the network via switched access. This should begin sometime next February, Johnson said.

Eventually, the retailer's stores could be tied into the virtual net via WATS or WATS-like services, but Johnson said he does not see "a lot of advantage to that right now."

Big billing

While Woolworth's stores may not be linked to Vnet, they are included under the retailer's new billing and billing management services. Acquiring advanced billing and related management services was the second most important factor in opting for MCI, Johnson said.

"A big piece of the action is being able to have aggregated bill-

(continued on page 6)

Infomart net links health care systems

By Wayne Eckerson
Staff Writer

DALLAS — Andersen Consulting recently announced it will spend $5 million to develop an exhibit at the Infomart here that will integrate state-of-the-art health care systems using industry network standards.

Called the "Hospital of the Future," the permanent exhibit will use Integrated Services Digital Network and the emerging Health Level-7 (HL-7) communications protocols to link a variety of devices, such as bedside computer terminals, radiological image management systems, smart cards for patient registration and critical care systems.

The exhibit, which is scheduled to open next May, is intended to show health care executives how new technologies can be integrated in a hospital environment, according to Jay Toole, worldwide director of health care consulting at Andersen Consulting, a systems integrator and consulting firm based in Chicago.

The exhibit will be the centerpiece of the newly announced Healthcare Technology Center in the Infomart, a 4-year-old exhibition hall that offers users a chance to view a wide variety of high-technology products.

Health care administrators will be able to tour the exhibit on their own or arrange to have Andersen Consulting managers and other vendor representatives demonstrate new capabilities for integrating medical technologies in formal presentations or hands-on labs.

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NCR

AT&T unveils systems to support Phase 2 of SONET

Users can employ ports once standards are set.

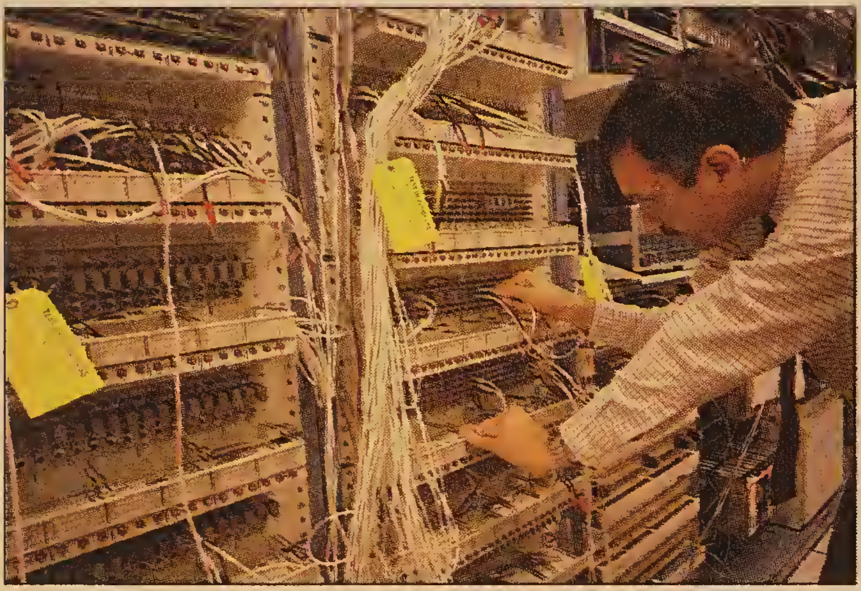
By Bob Wallace
Senior Editor

HOLMDEL, N.J. — AT&T Network Systems Group last week introduced transport and switching systems for public and large private net users that will support the emerging Synchronous Optical Network (SONET) standard.

The 2000 product line includes two renamed high-speed Digital Access and Cross-Connect Systems (DACS), a controller used to manage them, a multiplexer and an enhanced version of AT&T's first light-wave system, which will be used to deliver SONET-based services.

The AT&T announcement comes on the heels of rival Northern Telecom, Inc.'s introduction of its FiberWorld line of SONET products. Northern Telecom said it has spent more than $250 million on SONET technologies so far and expects to spend another $200 million in 1990. AT&T declined to say how much it has invested in SONET.

Fenner bills SONET as "the global transmission platform of the 1990s." The technology will enable telephone companies to deploy T-1 and T-3 services faster and less expensively, and provide switched multimegabit services.



Worker manually patches T-1 lines.

SONET defines standards for fiber-optic communications at transmission rates ranging from 1.544M bit/sec up to more than 2.5G bit/sec. Channel rates are supported in multiples of 1.544M bit/sec T-1 lines.

The AT&T products will support Phase 2 of SONET. "We will not introduce Phase 1 products in the U.S. because our customers have clearly told us they do not want to take equipment out of service and retrain [technicians, engineers] and maintenance people" once Phase 2 arrives, said Peter Fenner, president of AT&T's transmission systems business unit.

Telephone companies will be able to add SONET ports to their current DACSs without bringing the systems down, Fenner said. SONET ports for the two DACSs will not be generally available until the second quarter of 1992.

The 2000 line includes five major components: the DDM-2000 Network Multiplexer, the DACS III-2000 and DACS IV-2000 Digital Cross-Connect Systems, the DACScan-2000 Network Controller and the FT-2000 Lightwave System.

The DDM-2000 Network Multiplexer combines up to 84 T-1 or 24 T-3 channels onto a single 156M bit/sec fiber trunk. It can be located in the carrier's central office, or it can be placed on or near the customer's premises.

If located on the customer's premises, the DDM-2000 would provide feeds for multiple T-1 and T-3 multiplexers, and pass the traffic over the fiber trunk. Conversely, if it is located in the central office, the DDM-2000 would support multiple links to the customer's site.

The DDM-2000 will enable telephone companies to offer users high-capacity transport of voice, data and image. It will also provide increased flexibility and security, as well as better quality than copper-based systems, according to AT&T.

The renamed DACS III and DACS IV will support the DDM-2000. The new DACS III-2000 Digital Cross-Connect System — which already switches at SONET rates — supports up to 960 45M bit/sec channels and performs self-diagnostics. The system can be expanded to terminate 1,920 T-3s.

The DACS IV-2000 Digital Cross-Connect System switches T-1s and can rearrange T-1s within a T-3 link. It can be used to bring new transmission facilities on-line, retire unused lines and redirect links already in service.

The two DACSs load the traffic from the light-wave system onto a fiber interoffice channel running at speeds ranging from 622M to 2.5G bit/sec.

The DACScan-2000 Network Controller is a Sun Microsystems, Inc. workstation-based system used to monitor and control both DACSs.

It gives network technicians access to network data bases and uses color graphics to display equipment status.

The FTS-2000 Lightwave System is used in backbone transport applications. It carries multiple 156M bit/sec channels over a redundant fiber cable between DACSs.

Just the DACS

When used in conjunction with the DACSs, the DACScan-2000 Network Controller will help telephone companies reduce the amount of time needed to provision T-1 and T-3 links from 28 days to about six days, according to Fenner.

Users say the developing standard will not figure in their near-term networking strategies.

"If I choose to build a high-bandwidth network and SONET is the predominant standard at the time, that's the one I'll pick. But, I'm not going to decide to develop high-bandwidth [applications] just because SONET becomes available," said Jeff Marshall, managing director for communications at Bear, Stearns & Co., Inc., a leading New York-based investment firm.

Many of AT&T and Northern Telecom's SONET products will not be generally available until late 1990 or 1991.

Woolworth gives MCI $12m pact

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ing so that we can see usage trends by store on a single report each month," Johnson said.

"More importantly, we've been using that report to tell when a local Bell operating company has switched our store off MCI and onto somebody else. That happens more often than we'd like to believe."

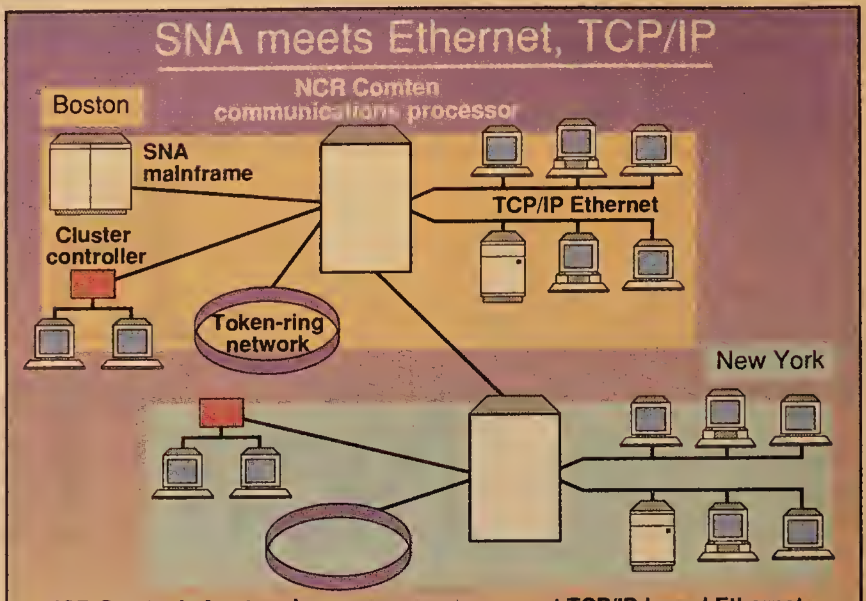
Woolworth receives a summary bill that lists total charges by location of the company's various divisions, such as Kinney Shoe Corp., Johnson said. The expense control departments in charge of each division get separate detailed bills for their respective operations, he said.

Meanwhile, MCI is bidding to provide Woolworth's corporatewide data network, which will be comparable in size to the voice net, Johnson said. Given that Woolworth is already using MCI services for voice communications, the carrier is in a strong position to snag the data network, too, Johnson said.

"It's definitely a consideration," Johnson said.

But AT&T and other carriers such as Williams Telecommunications Group, Inc. have some competitive offerings, he said.

SNA meets Ethernet, TCP/IP



NCR Comten's front-end processors now support TCP/IP-based Ethernets, enabling the processors to route traffic among multiple local networks and aggregate SNA and TCP/IP data over a single trunk.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: NCR COMTEN, ST. PAUL, MINN.

E-net interface enhances FEP

continued from page 4

front end to route TCP/IP data to an IBM mainframe or to nodes on other attached Ethernets.

The products can also aggregate TCP/IP data with SNA data for transport as a Synchronous Data Link Control data stream over a common trunk.

NCR Comten has taken a different tack than IBM.

IBM offers the 8232 LAN Channel Station, which ties Ethernets directly to an IBM mainframe channel. The IBM software that converts TCP/IP protocols to SNA-compatible protocols runs on the mainframe.

Analysts favored the NCR Comten approach.

"IBM won't let you combine TCP/IP and SNA over the same trunks," said David Passmore, a partner at Network Strategies, a consulting practice of Ernst & Young in Fairfax, Va.

NCR Comten's approach also adds Ethernet support to its front-end processors, which already supported token ring and X.25, said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C. consultancy.

Also, the approach creates a new role for NCR Comten front-end processors: tying Ethernets together or to other TCP/IP networks as peers without involving the mainframe, Dzubeck said.

In addition, the new products support bidirectional communications between TCP/IP and SNA nets, according to Kenneth Brantley, director of product management for NCR Comten. That means nodes on either network can act as clients or servers to nodes on the other net, he said.

The Ethernet LAN Interface adapter supports as many as three Ethernet ports, Brantley said. As many as 16 of the adapters can reside in NCR Comten's high-end Model 56X5 front-end processors for a total of 48 Ethernet connections. Other models support two to nine Ethernets.

Comten TCP/IP software comes in three modules. The first, and the only mandatory program, is a TCP/IP package that runs on the adapter card and on the front-end processor. It provides IP routing and features, such as error checking and packet sequencing, and includes the Telnet server function.

Telnet is the TCP/IP virtual terminal protocol. Its server function allows terminals or workstations attached to TCP/IP hosts to log on to SNA applications by emulating asynchronous or IBM 3270 terminals.

A second optional component is Telnet Client software that lets devices attached to the SNA net log on to remote TCP/IP hosts.

The third software module runs on an IBM mainframe under MVS and supports the TCP/IP File Transfer Protocol (FTP) and Simple Mail Transfer Protocol (SMTP).

FTP allows users to transfer files between SNA and TCP/IP-based networks, while SMTP supports the transport of electronic mail between TCP/IP nets and IBM's DISOSS.

> NCR Comten's approach also adds Ethernet support to its front-end processors.

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The first release of the software does not support links to IBM's Professional Office System and does not run under VM, although NCR Comten is considering supporting both in future releases.

All of the products are scheduled for availability in the first quarter of 1990.

The Ethernet interface adapter, configured with one Ethernet port, costs $8,000 with a monthly maintenance fee of $83. Additional Ethernet ports cost $3,000 with a $50 monthly fee.

Software modules range from $4,000 for the Telnet Client to $12,000 for the FTP and SMTP options. Each module also carries licensing charges ranging from $1,100 to $3,000 per year.

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See the FAXNeT Form on Page #65

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DEC to become Kodak's primary communications net contractor

By Wayne Eckerson
Staff Writer

ROCHESTER, N.Y. — Making good on an earlier commitment to focus on core businesses, Eastman Kodak Co. last week singled out Digital Equipment Corp. as the leading candidate to manage its voice and data networks.

The two firms entered negotiations to hammer out the details of a partnership that would give DEC day-to-day operational responsibility for Eastman Kodak's networks.

The contract, which should be finalized by the end of the year, is worth hundreds of millions of dollars and should span five to 10 years, said Alan Chase, group manager of products and services in Eastman Kodak's computing and telecommunications services unit.

The partnership mirrors a similar deal Eastman Kodak signed this past summer with IBM and Businessland, Inc. Eastman Kodak awarded IBM a contract to own and operate its data processing center located here and selected Businessland to be Eastman Kodak's exclusive supplier of microcomputer products and services ("Kodak chooses IBM to run, upgrade its DP operations," *NW,* July 31).

"The agreement is an innovative way to let our firm focus more of its resources on its core business," Chase said.

Under the agreement, DEC will act as the primary contractor to negotiate service and equipment contracts with carriers and vendors. It will also handle network maintenance, moves, adds and changes of network lines and equipment. DEC's likely subcontractors include AT&T, MCI Communications Corp., Rochester Telephone Corp. and IBM, Chase said.

Eastman Kodak will retain its Information Technology Management Group, which will focus on charting network strategy, for example, determining which net architectures, services and standards to

(continued on page 66)

Kendall routes APPN traffic over IBM net

continued from page 1

AS/400s and System/36s at over 20 sites.

The concurrent APPN upgrade is gradually displacing Advanced Program-to-Program Communications, which Kendall had been using to support communications between its minicomputers ("Health care company uses AS/400 as net keystone," *NW,* April 3).

The existing leased-line net is configured in a star topology. A central AS/400, dubbed KenNet, is located at headquarters here and used solely to route data throughout the network, said Robert Ravinski, networking engineer for KenTech Systems, Inc. of Mansfield, Mass. KenTech was formed by former Kendall employees and was hired by Kendall to run its net.

KenNet utilizes 9.6K bit/sec lines to support three major hubs, each supporting other minicomputers used by separate business units. The hubs, located in the Massachusetts towns of Mansfield, Westwood and Walpole, are tied by more 9.6K bit/sec lines to minicomputers in their respective business units, which are located as far away as California.

That configuration creates an inordinate amount of dependence on the central Boston hub. IIN solves that problem.

"If you have one hub, you're really jeopardizing your network," Ravinski said. "IBM now has their disaster recovery hot site tied into IIN. If corporate headquarters dies, the network does not."

In the beta test of IIN, Kendall linked four AS/400s — not the hubs — via 9.6K and 14.4K bit/sec lines to IIN nodes in Atlanta, Boston and Chicago. When the cutover is completed in February, Kendall will also have minicomputers linked to IBM sites in Los Angeles, New York, Paramus, N.J., and San Francisco, Ravinski said.

Each minicomputer linked to IIN must be configured for APPN, making it a PU Type 2.1 node capable of initiating sessions with any other node without the help of a mainframe, said James Stanley, senior systems engineer for KenTech.

Combining APPN support with the transport flexibility of IIN offers numerous advantages, Ravinski said. The network supports redundant data paths and is helping Kendall relieve the dependency on the central KenNet AS/400 here and the three AS/400s that act as hubs for each unit. "It's a true mesh network that gives you greater flexibility than other nets," Ravinski said.

With IIN, each site is connected to a local IBM-owned front-end processor at a nearby IIN point of presence, which routes the data to another IIN front-end near the target site.

According to Jeffrey Witzburg, vice-president of KenTech, the cost of IIN is approximately equal to the total Kendall paid for leasing and managing its private lines, plus the cost of the central KenNet AS/400, which will no longer be needed.

APPN cuts response time by about 50% because APPN network nodes can pass data much easier than an AS/400 configured for APPC. Under APPC, routing requires the AS/400 to actually run a program, which eats up CPU cycles and time. With APPN, that is performed at the microcode level, which means it does not appear as a job on the machine and takes less time.

APPN also supports dynamic alternate routing around failed nodes, which means data will find an alternate path to its destination should a node in its primary path fail, Stanley said.

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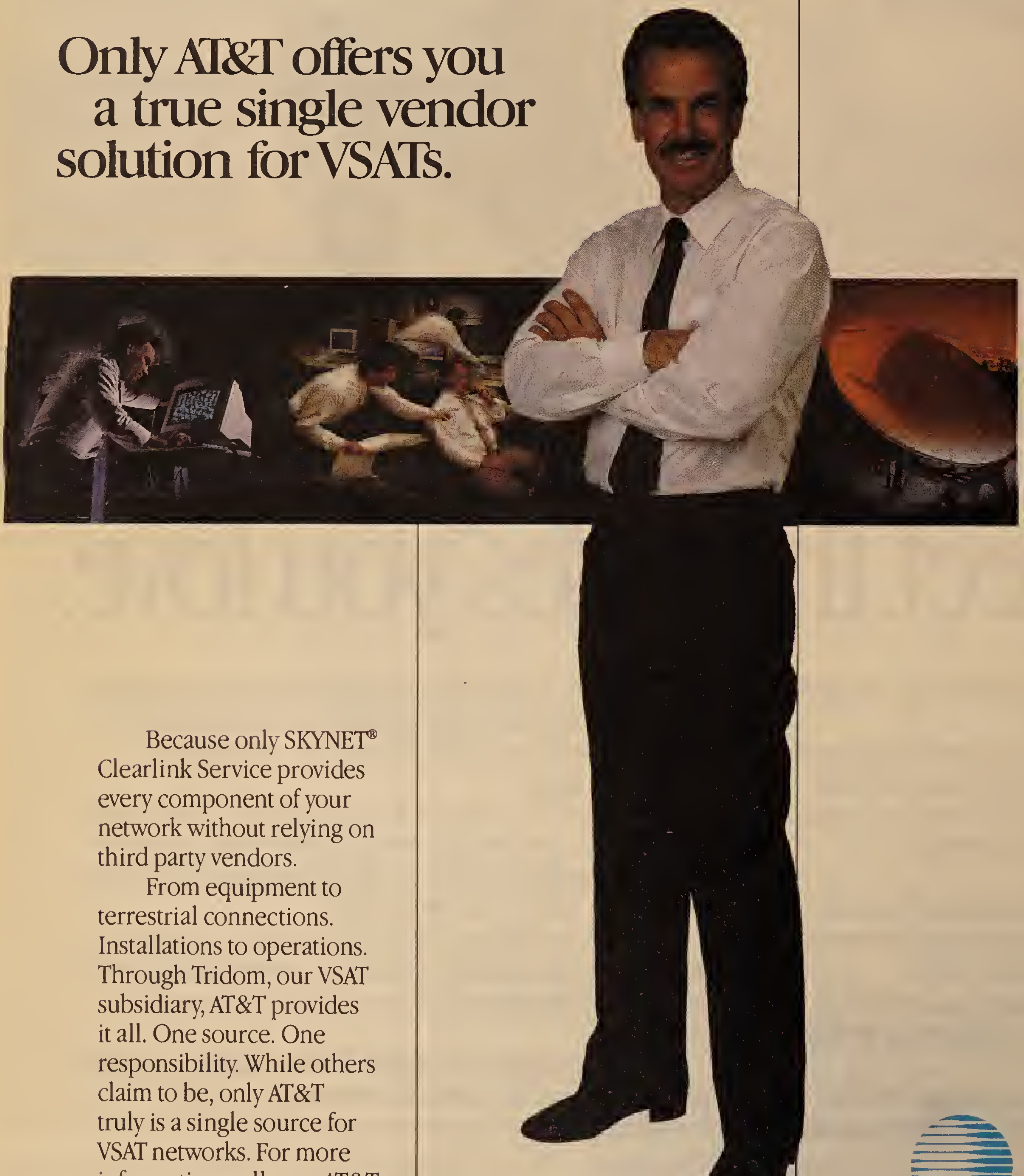

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INDUSTRY UPDATE

VENDOR STRATEGIES, MARKET TRENDS AND FINANCIALS

Worth Noting

"The voice mail industry will grow 48% annually over the next five years, increasing from current revenues of $224 million to $1.86 billion in 1994. The bulk of the market's growth will come from RBHCs entering the residential and small business markets, and service providers that target the large business market."

Excerpted from "Voice Mail: The New Service Businesses"
Probe Research, Inc.
Cedar Knolls, N.J.

People & Positions

Bell Atlantic Corp. last week named **Hyde Tucker** president and chief executive officer of its **Bell Atlantic International, Inc.** subsidiary effective Jan. 1.

Currently, Tucker is vice-president and chief operating officer of Bell Atlantic's Chesapeake & Potomac Telephone unit.

Tucker will succeed **Salvatore Barbera**, who will assume the newly created position of Bell Atlantic International chairman on Jan. 1; Barbera will continue in that capacity until his retirement April 1, 1990.

John Rhodes was recently named marketing manager for videoconferencing products and systems at **Sony Corp. of America**'s Video Conferencing and Satellite Systems Division in Park Ridge, N.J.

Rhodes' responsibilities include developing new products and services for Sony's videoconferencing markets. He will report to T.C. Browne, vice-president and general manager of Sony. Previously, Rhodes was marketing manager at Sony's Professional Video Division. ◼

Study: Retail slump feeding voice, data services market

Retail managers look to new net services for edge.

By Bob Brown
Senior Editor

VILLANOVA, Pa. — The slumping retail industry is an ideal market for emerging voice and data services offered by public carriers, according to a recently issued report.

Integrated Services Digital Network offerings, central office-based local network services and virtual private networks are among the new services that are becoming increasingly appealing to the retail market, according to the study "Retail Industry: An Ideal Market for Switched Services" conducted by O'Brien Associates, a market research firm based here.

As retailers battle one another during the current market malaise, telecommunications is emerging as the primary weapon to gain a strategic edge by cutting costs and improving customer service, said Brad O'Brien, president of O'Brien Associates. The survey is based on interviews with equipment vendors, service providers and users.

Telecommunications spending by retailers is expected to grow from about $9 billion this year to $17 billion by 1995 as individual retailers increase their telecommunications budgets and more retailers pepper the already crowded market, he said.

The retail market survey also indicated a wholesale change in the way retailers are using telecommunications products and services (see "Retail detail," page 30).

Retailers need to communicate at high speeds with credit card authorization bureaus, for example, to provide customers with prompt service, he added.

Second- and third-tier retailers, such as those that operate on a regional and local basis, will create the largest demand for emerging switched services, according to O'Brien.

Many retailing giants, such as Wal-Mart Stores, Inc., have already set up vast very small aperture terminal nets and are less likely to do away with those investments. National retailers, however, will likely test the integration of switched services into their VSAT nets, O'Brien said.

"I see the retail industry — especially the midsize companies — in a [network services] transition mode," O'Brien said. Top retailers have "pretty much solidified their use of information technology," he said.

Instead of following the examples of their larger rivals, users at second- and third-tier companies

(continued on page 10)

INDUSTRY BRIEFS

Prime Computer, Inc. last week said it will lay off roughly 2,500 employees — about 20% of its work force — as part of a major cost-cutting reorganization.

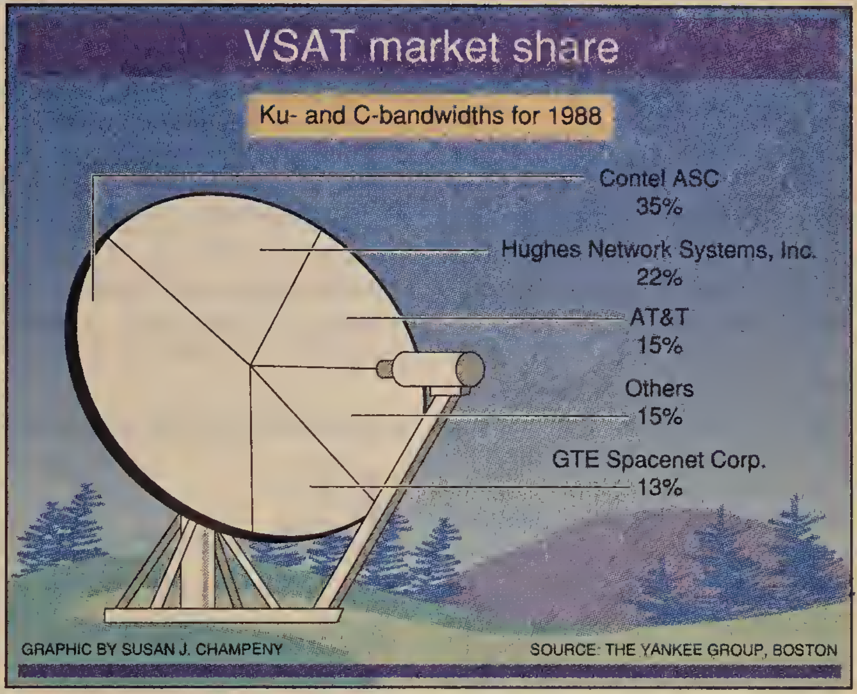
Over the next several months, Prime will be reorganized under four profit centers: the Computervision Business Unit, which will have primary reponsibility for computer-aided design and manufacturing offerings; the Minicomputer Business Unit; the Customer Support Business Unit; and the International Business Unit. James McDonald, Prime's president and chief executive officer, said the new units will be better able to address customer needs, research and development, distribution channels, and sales and marketing strategies.

A spokeswoman for Prime said the company's new business plan will not affect its recently announced plans to develop products supporting Novell, Inc.'s Portable NetWare. "The agreement is still in force, and we are continuing to actively promote it," she said. Prime also said it will continue to enhance the performance of its 50 Series computers, which run on Prime's proprietary operating system, and increase the ability of its other products to interact with Unix-based systems.

Northern Telecom, Ltd., the Toronto-based parent company of **Northern Telecom, Inc.** of Nashville, last week reported improved earnings and revenue for the third quarter ended Sept. 30.

The company posted earnings of $75 million for the third quarter, up 34% from $56 million for the third quarter last

(continued on page 10)



GRAPHIC BY SUSAN J. CHAMPENY SOURCE: THE YANKEE GROUP, BOSTON

Timeplex exec details firm's mux strategy

President Victoria Brown eases concerns about possible layoffs, outlines company directions.

Victoria Brown is president of Timeplex, Inc., a Woodcliff Lake, N.J.-based multiplexer manufacturer. Brown was named president shortly after the 20-year-old company was acquired by Unisys Corp. in January 1988. She joined the company in 1976 as assistant vice-president of sales support and customer service.

In an interview last week with Network World *Washington Correspondent Gail Runnoe, Brown laid to rest concerns that Timeplex would be affected by pending layoffs at its parent company, offered her views on the changing multiplexer market and confided what strategies Timeplex will follow to keep pace with user demands.*

Your parent company, Unisys, has said it will lay off as many as 8,000 employees and that Timeplex could be affected. Will Timeplex lay off employees due to Unisys' fiscal situation?

No. Our business plan is done, and we will decide for ourselves whether to expand or contract in certain business sectors. Timeplex is treated [by Unisys] as an independent business unit. Our staffing and other costs are currently evaluated in light of our own revenue and profitability. We are not influenced by the Unisys business plans.

Of course we are always looking to where we can consolidate to benefit our cost and overhead structure. When we identify those areas we can consolidate, we certainly are going to do just that.

But our current plans don't call for layoffs.

In what ways do you see the T-1 multiplexer market changing, and what are users looking for in a vendor?

You have a situation in which there are established players and small players that are trying to get into the marketplace through either cost cutting or aggressive discounting. The computer companies and telephone companies are also participating more aggressively than they did in the past.

I believe customers are looking for a few strategic vendors that can offer a broad enough product range to fulfill their entire networking requirements, whether it be in the T-1 or emerging T-3 networking market, or to take advantage of new tariffs,

(continued on page 10)

Timeplex miniprofile

Revenue:
- 1989: $225 million (Projection by Yankee Group)
- 1988: $170 million (estimated)

Employees: 2,000 worldwide

Product lines:
- Link multiplexers
- Timepac packet switches
- Time/View network management systems

Service and support offerings:
- Link/Design Network Planning Service
- ComWatch Remote Network Monitoring Service

Timeplex

SOURCE: TIMEPLEX, INC., WOODCLIFF LAKE, N.J. AND THE YANKEE GROUP, BOSTON
GRAPHIC BY SUSAN J. CHAMPENY

OSF narrows its choices for distributed computing

By Bob Brown
Senior Editor

CAMBRIDGE, Mass. — The Open Software Foundation (OSF) last week said it has narrowed down the field of responses to its request for technology (RFT) to build a distributed computing environment.

OSF said it received 50 responses to its RFT and has since weeded out almost half, leaving 28 submissions for evaluation.

Hewlett-Packard Co.'s Apollo Division and Sun Microsystems, Inc. submitted their respective Network Computing System and Open Network Computing technologies, leading the pack of submissions.

One user proposal, that from Chemical Abstracts Service, remains in the running to influence OSF's distributed computing environment. The deadline for submissions was Oct. 6. OSF, which issued the RFT on June 13, is an organization dedicated to the development of an open, portable software environment.

By selecting a distributed computing environment technology, the OSF hopes to accelerate the creation and use of distributed applications, said Jonathan Gossels, OSF business area manager for interoperability. "That means network traffic will increase, and communications will become an increasingly integral part of computing," he said.

The distributed computing environment technology chosen by the OSF will also lay out how developers should build remote procedure call (RPC) technology into distributed applications, he said. RPCs break up a task in an application and parcel out subroutines to other computers in the network.

OSF is expected to reach a decision by the second quarter of next year, Gossels said.

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The user speaks

Les Wibberley, senior engineer for Chemical Abstracts Service, a division of the American Chemical Society in Columbus, Ohio, said he does not expect his company's proposal "to solve every problem in the world." But the technology has worked well enough at Chemical Abstracts Service to make it worth sharing with others, he said.

Chemical Abstracts Service developed distributed computing tools to help orchestrate the company's main line of business — providing on-line data base services such as chemical companies and universities.

The tools help Chemical Abstracts Service build data bases and give customers access to them from nodes in the U.S., Japan and West Germany.

All RFT qualifiers have been invited to join in the RFT Technology Review, which will be held in conjunction with an upcoming OSF member meeting Nov. 6 to 10 in Boston. Those organizations whose submissions qualified for further review will present their strategy before attendees at this upcoming meeting.

Several companies presented joint submissions to OSF for the distributed computing environment RFT, Gossels said, but OSF rules prohibit him from detailing those agreements, he said.

OSF is expected to reach a decision on the technology submissions by the second quarter of next year, Gossels said. Rather than select the technology from one submission, it may combine elements from several of the participants' offerings, he said.

Timeplex exec details strategy

continued from page 9

such as fractional T-1 or any other kind of subrate data multiplexing.

Customers are looking for a new range of services, including systems integration, training, network maintenance management and consulting.

In what areas is Timeplex looking to expand its presence in the months ahead?

An obvious area of expansion is the T-3 marketplace. Our statement of direction is that we plan to offer T-3 and [Synchronous Optical Network] solutions.

We acquired Broadband Telesystems Corp. [in August 1989] — a company that has the technology to not only network in the T-3 area but also to migrate the technology to SONET-compatible networking standards.

Another area, of course, is premises-based networks. We will be expanding and offering our customers the ability to connect the local network and the wide-area network in existing Ethernet-type networks and future FDDI networks.

The interconnecton of LANs over the wide-area network is having a dramatic impact on the amount of data that is being carried over T-1 networks. I think the trend is going to be that the percentage of voice is going to decrease and the amount of data put on the network is going to substantially increase.

Will increasing demand in the T-3 market have any affect on the T-1 market?

I think the emerging T-3 market is going to be affected by the same factors that caused the T-1 market to grow. T-3 is a volume discount over T-1, and you have to have enough traffic to cost-justify putting in that bandwidth.

I think the T-3 market is going to be affected by the same factors that caused T-1 to grow.

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In the short-term, there may be some displacement of T-1 by T-3, but if you look across the entire network, you're going to have to bring more data toward the T-3 central point. You'll have a T-3 communicating between very large data centers, but then you'll probably have a lot more remote locations using T-1 coming on to that backbone.

From my perspective, I think it's going to modestly slow the T-1 market while capacity is being built up and T-3s are being installed. Then I think it will go back to a more natural growth rate. A lot will depend on the T-1 tariffs.

What percentage of Timeplex's revenue is now spent on research and development, and what technologies are especially important?

On average, we're spending over 10% of our revenue on R&D. We are continuing to add features and functions to our Link products, our [Timepac] packet-switching product line and T-3 products. The whole area of network management architecture is also a substantial part of our research and development efforts.

Timeplex's Victoria Brown

We are also allocating money to advanced development, looking at compression techniques and future architectures.

In what areas of its business will Timeplex invest heavily?

We are continuing to invest strongly in the international marketplace. Almost 50% of our revenue is generated outside the U.S., and we continue to view the international arena as a major growth area for our business. It is an emerging market in the sense that digital services have only become available in many countries over the last couple of years.

We've also spent a lot [of money] investing in service. We have several new initiatives that were begun in 1989. One is called Comwatch, which reflects our ability to perform network maintenance management for customers. We also have a group called Integrated Services, which designs and builds the network for the customer.

How is Timeplex differentiating itself from other net management suppliers?

In the area of network management, we've been very clear on the architecture. We have a common user interface in our TimeView product, which is icon-driven. The purpose of that is to allow less technical operators to manage the network. We also see a lot of turnover in net management positions, so we're building expert systems to support the network manager. That way, the net management software can perform menial tasks.

Retail slump feeding market

continued from page 9

are increasingly likely to opt for emerging switched services, such as ISDN, O'Brien said.

ISDN would challenge VSATs on the basis of both price and service quality, he explained. VSAT networks have gained recent favor among retailers because they can support such applications as credit card authorizations at a lower price than leased-line options and at a better transmission rate than existing switched services, he said.

Separately, a recent report titled "Competitive Strategies for ISDN Services" from Business Research Group in Newton, Mass., also concluded that ISDN fits the needs of users in the retail market. Large retail chains are distributed organizations that demand "a flexible, well-coordinated network" for which ISDN is ideal, the study said.

Virtual private network services will be attractive to retailers because they offer flexibility and cost savings, O'Brien said. Retailers can take advantage of a virtual net's dedicated links for stores with high volumes, and a virtual net's switched connections are ideal for stores with small communications demands.

Central office-based local networks will fit the needs of a growing number of retailers that are putting more of their store's applications onto personal computers, O'Brien said. This type of service will be especially valuable to retailers that have a lot of stores within a metropolitan area served by the same central office.

For more information about O'Brien's study, write to O'Brien Associates, 237 Trianon Lane, Villanova, Pa. 19085, or call (215) 527-3274. For information about Business Research's study, call (617) 964-6204.

Industry Briefs

continued from page 9

year. Northern Telecom reported $1.41 billion in revenue for the third quarter, up 13% from $1.25 billion for the third quarter last year.

The improved financial results "reflect the positive effects of the restructuring and corporatewide streamlining programs announced late last year," said Paul Stern, Northern Telecom's vice-chairman and chief executive officer.

The most significant revenue growth rate in the third quarter was reported from Northern Telecom's international businesses, the company said.

Sun Microsystems, Inc. last week reported that earnings plummeted about 75% to $5.2 million in its first fiscal quarter ended Sept. 30 from $20.6 million in the first quarter last year.

Earnings rebounded, however, from a net loss of $20.3 million reported in Sun's fourth fiscal quarter for 1989 ended June 30. Revenue for the first quarter was $538.5 million, up 39% from $388.5 million reported in the first quarter the year before.

Scott McNealy, Sun's president and chief executive officer, attributed the year-to-year earnings decline to lingering effects from the company's major new product transition, which began in April.

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advertised in this week's issue
of *Network World*,
see the FAXNeT Form on Page 65

FAXNeT

TELECOMMUNICATIONS

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Worth Noting

Total carrier revenues from the sale of ISDN Basic and Primary Rate Interface services will increase from $484 million in 1989 to $3.91 billion by 1995, according to a study released last week by Frost & Sullivan, Inc., a New York-based consultancy.

Carrier Watch

Eighteen of Europe's largest national carriers recently agreed to work toward developing a one-stop shopping service for users with pan-European networks.

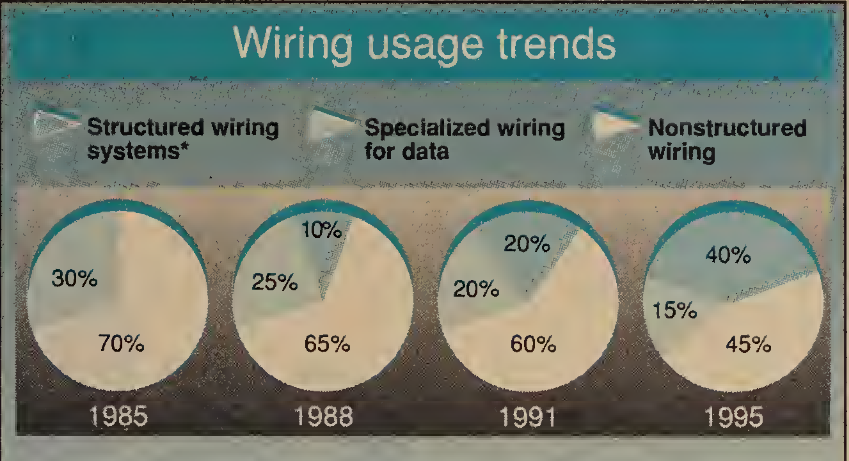
The carriers — which include **British Telecommunications PLC** and **Mercury Communications, Ltd.** — signed a letter of intent to develop a system over the next year on which any carrier could act as a single point of contact for users acquiring private lines throughout Europe. The carriers also want to provide users with a single bill for private lines and a single source for reporting network problems.

Carrier representatives and users seemed split on how beneficial the agreement will be for users.

"This is something that will make it easier for our international customers to do business abroad," the British Telecom spokesman said. "Many of them don't like the confusion of dealing with different regulatory environments and this will help rectify that."

Some users, however, were less sanguine. "If it's simply a matter of providing an additional service, we'd like it and probably use it," said James Bailie, manager of international networks for Hartford, Conn.-based United Technologies Corp.

But Bailie said he fears that the European carriers may attempt to use the one-stop shopping agreement as a means to fix network prices and limit competition.



*Structured wiring systems include AT&T's Premises Distributed System, the IBM Cabling System and Northern Telecom, Inc.'s Integrated Building Distribution Network.

SOURCE: COMPUTER TECHNOLOGY RESEARCH CORP., HOLTSVILLE, N.Y.
GRAPHIC BY SUSAN J. CHAMPENY

Nynex strike keeps users on hold; mediators named

Customers accept delays as part of business.

By Gail Runnoe
Washington Correspondent

NEW YORK — As the strike against Nynex Corp. enters its 13th week, users in the Northeast remain on hold, waiting for repairs and cutovers of services and facilities.

Approximately 17,000 managers in the regional Bell holding company are hustling to keep up with service demands, trying to fill the shoes of some 60,000 members of the Communications Workers of America (CWA) and the International Brotherhood of Electrical Workers (IBEW), who went out on strike Aug. 6.

However, some progress has been made. Nynex recently announced that Malcolm Read Lovell Jr. will act as a mediator in its dealings with the CWA, and Donald White will fulfill the same function for the IBEW.

Shifting costs for health care benefits remains one of the most divisive issues on the bargaining table.

A spokesman for New York Telephone Co. said new service orders that would usually be fulfilled in three or four days are now taking four to six weeks. "Obviously, we can't provide the same level of service we did before the strike," he said. "We're trying to do as much as we can."

In general, users are taking the strike in stride and trying to build time for delays into their project planning. A spokesman for Reuters America, Inc. in New York said, "The Nynex people are taking our orders as fast as they can . . . under very trying circumstances."

Reuters is in the process of deploying a new service called Globex — an electronic futures and options trading system jointly developed by Reuters and the Chicago Mercantile Exchange. The service is now being cut over in Chicago, New York and cities in Europe and Asia. In New York, however, installations of needed phone lines are going slowly.

Donald Gaffney, vice-president of telecommunications at Fundamental Brokers, Inc. and a participant in a private network project New York Telephone is handling for the Securities Industry Association (SIA), said Phase 1 of the network got under way two weeks ago. Network construction was originally scheduled to begin in early August.

> "We can't provide the same level of service as before the strike," a Nynex spokesman said.

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Despite the 10-week delay, he said he expects progress will now proceed as originally planned. The network, which will link SIA member companies, nonmember companies and the major stock exchanges, is expected to be completed by July 1990, Gaffney said.

In addition to the SIA project, Gaffney said his company has put in numerous service orders with New York Telephone, without getting any indication when the job might be done. Gaffney said his only alternative would be to use a bypass carrier such as Teleport Communications — New York.

While Fundamental Brokers currently does not use any bypass carriers, Gaffney said he is considering a proposal from New York Teleport for some lines. "It's really an economic deci-

(continued on page 14)

Bank dumps PBXs, opts for Centrex net

First Fidelity expects its N.J. Bell-provided electronic tandem net will save it over $2 million.

By Bob Wallace
Senior Editor

NEWARK, N.J. — First Fidelity Bancorp. is replacing 21 private branch exchanges with a Centrex network in a move designed to reduce staff and save $2.1 million over the next three years.

The New Jersey Bell Telephone Co.-built electronic tandem network links four main Centrex sites on a T-1 backbone and supports 21 remote Centrex serving offices, providing 9,000 lines of digital Centrex to some 300 branches statewide. The network supports a uniform seven-digit corporate dialing plan and enables calls to be transferred among branches.

In going with Centrex, First Fidelity broke from its strategy of controlling and maintaining a private network. First Fidelity's multitiered Centrex network is more reliable, easier to run and less expensive to operate than its original PBX network, said John Barbosa, senior vice-president of communications and technical service for the bank.

"We were faced with having to replace or expand our switches, and build specially conditioned rooms for them," Barbosa said. "Our network was already difficult to manage. We decided we didn't want to be in the telephone business any longer."

Network reliability had also become a major problem for First Fidelity as its PBXs aged and network traffic began to increase. In addition to alleviating that problem, the new network simplifies on-net calling by enabling users to access the network by dialing a single tie-line code instead of multiple codes.

First Fidelity issued a request for proposal for the network in mid-1988. The bank received PBX bids from AT&T, Northern Telecom, Inc., IBM/Rolm Systems Division and Bell Atlanticom Systems, Inc., which is Bell Atlantic Corp.'s equipment sales subsidiary. New Jersey Bell proposed digital Centrex.

"New Jersey Bell and Bell Atlanticom were both telling us they had the best solution for the bank. We told them to go back and put together a joint bid that included Centrex and station equipment," Barbosa said.

The two Bell Atlantic compa-

(continued on page 14)

WASHINGTON UPDATE

BY ANITA TAFF

Questioning the importance of the NTIA. Despite the crusade of several key members of Congress to play up the importance of telecommunications to the U.S. economy and the need for a coherent national telecommunications policy, there are still doubters.

Last week at an authorization hearing for the National Telecommunications and Information Administration (NTIA), Rep. William Dannemeyer (R-Calif.), a member of the House Committee on Energy and Commerce, questioned the value of the NTIA in a time of shrinking federal budgets. "If we don't authorize this [appropriations] bill, I don't think anyone would miss [the NTIA]," he said.

Rep. Edward Markey (D-Mass.) asked the committee at the hearing to appropriate $14.6 million for the agency in 1990 and $14.7 million for 1991. In his role as chairman of the House Subcommittee on Telecommunications and Finance, Markey is pushing for a more coordinated federal approach to telecommunications and says the NTIA is a key agency since it is the principal advisor to the president on such matters.

Markey warned that the U.S. is putting too little emphasis on telecommunications and is falling behind other countries such as Japan, France and Germany. "I suppose we could eliminate what little we do have and just see how it all turns out in the year 2000," Markey joked.

I want my ISDN. In order to provide better billing, the

(continued on page 14)

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Bank dumps PBXs for Centrex

continued from page 11

nies joined forces, put forth a joint bid a few weeks later and won the First Fidelity contract — the largest joint sale they have made to date.

"The bank's been through 26 or 27 [acquisitions] of smaller banks. With Centrex, we can easily and simply accommodate growth without having to worry about upgrading equipment or obsoleting station equipment," Barbosa noted.

Today, the network is roughly half completed.

A T-1 backbone links a central office switch here to other Bell operating company switches in North Brunswick, Burlington and Totowa, N.J. Those switches are used to support the bank's four main sites. New Jersey Bell is in the process of tying 21 other bank Centrex serving offices to the backbone using tie lines and T-1s.

When the network is completed in about 10 months, First Fidelity will have about 9,000 lines of digital Centrex throughout the state, making it one of New Jersey Bell's top three Centrex customers.

Station equipment from Bell Atlanticom includes electronic key systems and single-line telephone sets from Eagle Telephonics, Inc. and attendant consoles from Conveyant Systems, Inc.

The $2.1 million that First Fidelity expects to save will come from several areas, including payroll. The bank reduced its operator corps by six at just one of its four main sites and trimmed two telecommunications technicians from its staff, Barbosa said.

The bank needs fewer operators than it used to because with the old network, each call was sent to a central group of operators here and then transferred over the tie-line network to its intended destination. Calls are now routed directly to the desired bank office. "We just don't need as many operators as we did with the old network," Barbosa said.

The Centrex network is also enabling First Fidelity to replace an undisclosed number of expensive tie lines. In addition, the bank has eliminated consultants that it had used to analyze tie-line traffic trends and specify the number of links needed between offices, Barbosa said.

Hughes' New Ku-Band Fleet Has Businesses Everywhere Looking Up

Hughes Communications is expanding into Ku-band satellite services, and that's good news for your business.

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Strike keeps users on hold

continued from page 11

sion," he said. Using a bypass carrier "gives you the benefit of diverse routing, but it also gives you administrative problems."

But he acknowledged, "There is nothing you really can do [to prepare for an extended phone company strike] except look at alternative carriers." He said that when the strike started, he was told it could last as long as six months, and he is not optimistic that mediation will hasten the strike's resolution.

"Mediators might run into the same brick wall" union and phone company negotiators have, he said.

Also stymied by the strike, member companies of the Wall Street Telecommunications Association (WSTA) have been working with New York Telephone to get some circuits installed.

Each of the group's members was recently asked to submit a list of their five most needed voice and data private-line orders, ranked in order of importance.

While the phone company may not be able to meet everyone's needs, it will try to address top priority jobs, said Thomas Festa, president of WSTA and vice-president of communications at Third Generation Brokers Corp.

Washington Update

continued from page 11

General Services Administration is pushing its Federal Telecommunications System (FTS) 2000 vendors, US Sprint Communications Co. and AT&T, to provide Integrated Services Digital Network services earlier than scheduled.

Although AT&T and US Sprint have promised to provide ISDN for FTS 2000 customers by January 1991, Mike Corrigan, deputy commissioner for telecommunications services at the GSA, last week told attendees at the Federal Computer Conference he would like to have ISDN in place by October 1990.

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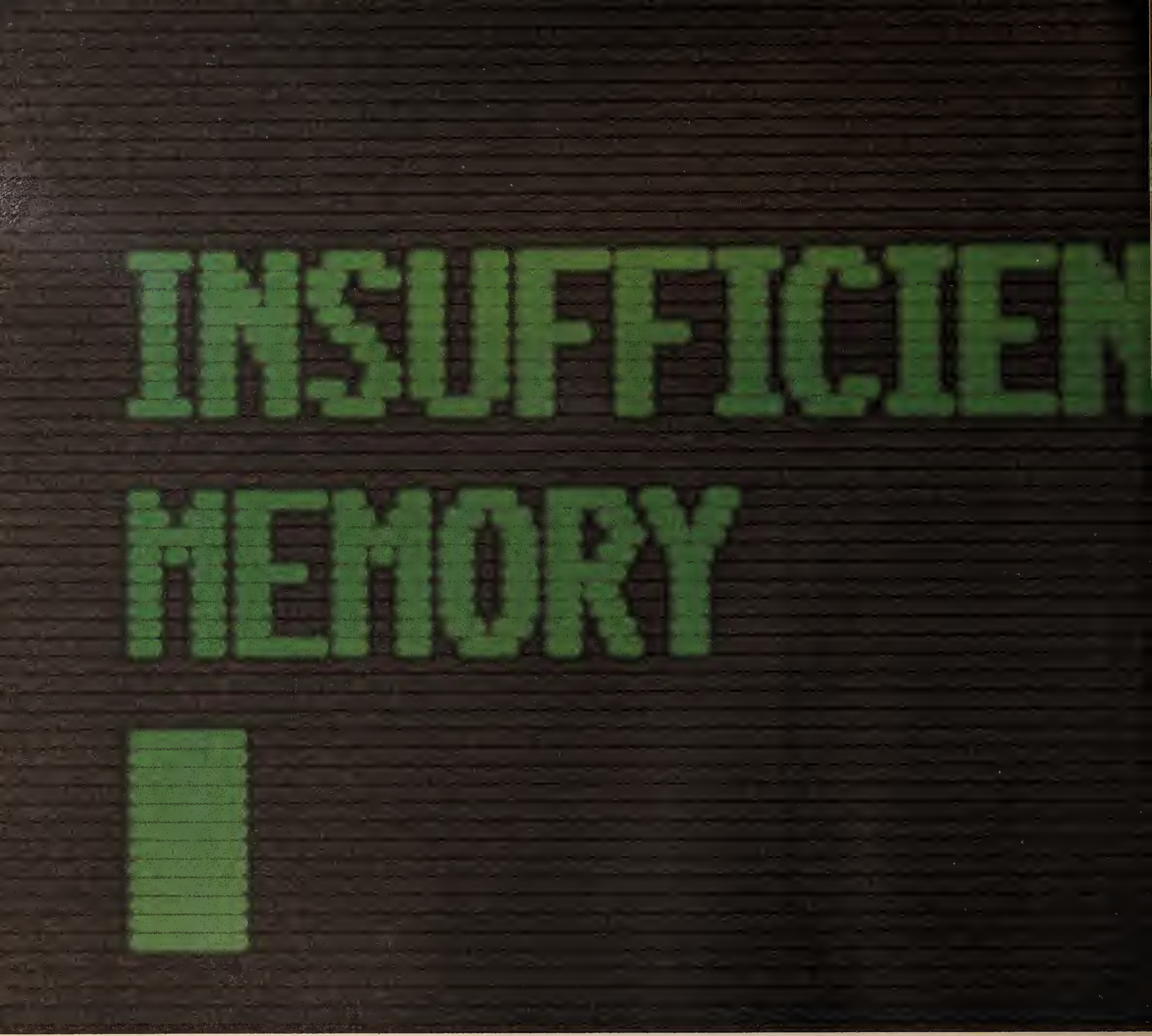

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DATA COMMUNICATIONS

PRODUCTS, SERVICES, ARCHITECTURES, STANDARDS AND NETWORK MANAGEMENT

Worth Noting

Mexican air carrier Aeromexico recently awarded a $6 million contract to Unisys Corp. for computer and networking equipment that will link local workstation nets in airports and travel agency terminals to its data center in Mexico City.

Data Packets

Cylix Communications Corp. is expected this week to roll out its Micro-Hub product, a hardware and software package that enables users to build a private VSAT network earth station hub that serves from 10 to 300 remote sites.

Micro-Hub includes a very small aperture terminal, a host interface unit (HIU) and a network status terminal that is located at the user company's headquarters.

Users must outfit each remote site with a VSAT and satellite modem. Micro-Hub's HIU is a small switch that routes messages via satellite from the user's data center to the appropriate remote VSAT.

The network status terminal is an asynchronous or synchronous network management console that allows customers to monitor and control the VSATs at central and remote sites. Cylix will retain the capability to monitor and control VSATs from its Super Hub in Memphis, Tenn., giving customers the option of hiring Cylix to perform net management functions.

Micro-Hub supports data transmission at up to 19.2K bit/sec. Cylix will dedicate a channel on a satellite transponder to each Micro-Hub user.

Micro-Hub hardware costs from roughly $50,000 for 10 remote sites to $90,000 for 200 remote sites. Users also must pay for monthly transponder and maintenance service fees ranging from $8,000 to $50,000.

Quick response strategy pays off for store owners

Technology helps businesses run more efficiently.

By Bob Brown
Senior Editor

NEW ORLEANS — Quick response, the retail industry's answer to just-in-time manufacturing, is being adopted by retailers at a rapid rate, said attendees at the recent Retail Information Systems Conference '89 here.

The quick response strategy helps retailers keep inventories low while keeping shelves stocked with popular merchandise. The strategy is founded on the rapid exchange of information between retailers and suppliers using technologies such as point-of-sale data collection and electronic data interchange.

But quick response is more than just networking — it's a new way of doing business, users said.

Michael Shannon, a vice-president at Mercantile Stores Co., Inc. in Wilmington, Del., said EDI played a key role in helping the company adopt quick response. But the benefits of this emerging business strategy are in the improved relationships Mercantile Stores has since developed with its suppliers, he said.

Successful quick response programs are based on mutual trust, said Jeffrey Luker, a partner with the Andersen Consulting arm of Arthur Andersen & Co. "Quick response should not be done at the expense of [the retailer or supplier]."

Andersen Consulting earlier this year released a study conducted on behalf of the Voluntary Interindustry Communication Standard Committee, which oversees the development of a retail-specific subset of the ANSI X12 EDI standards. The study said retailers could save $9.6 billion a year by using quick response systems.

Robert Ferkenhoff, vice-president for information services at Sears Roebuck & Co.'s Sears Merchandise Group in Chicago, said the company has been using EDI since the early 1970s. Sears expects its expanding use of standard EDI formats to pave the way for wider use of quick response as well, he said.

Sears plans to be swapping industry-standard EDI documents

(continued on page 18)

DATA DIALOGUE

BY JOE MOHEN

Coaxial analyzers make life a lot easier

Most people have seen the television-like device called a protocol analyzer, which shows all the bits on a communications line. Like videocassette recorders, most models can record and play back.

Although not widely known, coaxial analyzers, also called coaxial scopes, have been used to isolate problems in the dumb terminal world for quite some time.

In today's market, with users mixing various brands of 3270 emulation boards that are controlled by IBM cluster controllers, coaxial analyzers are especially useful to establish which vendor's product is at fault.

The physical link between an IBM cluster controller and a terminal or personal computer has traditionally been hidden from users. You could not see the flow of data between a personal computer with a Digital Communications Associates, Inc. Irma board, for example, and a 3174.

That's because the protocol used in those emulation boards — the Control Unit Terminal (CUT) interface — was neither ASCII nor EBCDIC, but rather unfamiliar scan codes.

The newer coaxial cable protocol — Distributed Function Terminal (DFT) — not only calls for the actual EBCDIC data to be sent along the coaxial cable, but also transmits Systems Network Architecture Path Information Units (PIU), making it difficult to understand the data. (A PIU is the rough equivalent of a packet in X.25 technology.)

PIU data, which is found in a data transmission header, can

(continued on page 18)

Mohen is an SNA specialist and consultant based in New York.

International satellite circuit costs

Country	INTELSAT Business Service Circuit	Voice-grade analog circuit
Belgium	$8,830	$6,785
France	$7,910	$5,776
Germany	$8,917	$6,683
Netherlands	$8,689	$7,022
Switzerland	$8,922	$6,850
United Kingdom		
British Telecommunications PLC	$8,289	$6,595
Mercury Communications, Ltd.	$7,865	$5,665

Monthly rates for a 64K bit/sec digital satellite link vs. a voice-grade satellite circuit conditioned to support data at speeds up to 19.2K bit/sec. Rates indicate costs between international services gateways.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: LYNX TECHNOLOGIES, INC., LITTLE FALLS, N.J.

DEC to push DECnet as backbone for SNA

Company preps SNA Portal as part of strategy to run SNA, TCP/IP and X.25 data over DECnet.

By Jim Brown
Senior Editor

MAYNARD, Mass. — Digital Equipment Corp. is developing a pivotal product in its strategy to offer DECnet as a backbone alternative to IBM Systems Network Architecture networks, analysts said.

The strategy would enable users to run SNA, as well as other forms of data, over a DECnet backbone, thus reducing the need for separate wide-area links for SNA, DECnet, packet-switched and other data.

The key to the strategy, analysts said, is deployment of SNA Portal, a product under development that will allow DECnet to transport SNA traffic. DEC revealed its plans for SNA Portal to analysts at a briefing earlier this month in Boston.

SNA Portal, which is expected to be available by 1991, is the latest in a line of products that DEC calls portals, which encapsulate X.25, Transmission Control Protocol/Internet Protocol or SNA data into a DECnet envelope for transmission across a DECnet network.

The SNA Portal, for instance, will wrap SNA Synchronous Data Link Control packets in DECnet envelopes that are then transported across a DECnet backbone. An SNA Portal at the receiving end would strip away the DECnet envelopes and route the packets to their destination on an SNA subnet.

DEC already has an X.25 portal product, called X25portal 2000, which enables DECnet to route traffic between X.25 nodes. It also offers Internet Portal, which lets DECnet route traffic between TCP/IP-based networks ("New DEC device links TCP/IP across DECnet," *NW*, Oct. 23).

Users wishing to carry SNA, X.25 and TCP/IP traffic over DECnet are required to purchase the portal designed for each of these specific types of data.

Currently, users are required to maintain separate circuits among nodes on SNA, X.25 or TCP/IP networks. Merging all the traffic through the portals onto a DECnet backbone reduces the number of wide-area links a company must maintain between its remote offices and central site, analysts said.

> "DEC is going to position DECnet as the preferred backbone architecture."

▲▲▲

"DEC is going to use these portals to position DECnet as the preferred backbone architecture," said Steve Wendler, program director for office information systems at Gartner Group, Inc., a market research firm in Stamford, Conn.

Users can employ an SNA Portal, for example, to route SNA traffic from remote offices to the central site via a DECnet backbone, "thus positioning SNA as a leg bone off the DECnet backbone."

The SNA Portal will emulate a Physical Unit Type 4 or 5 device in an SNA network, appearing to IBM cluster controllers as an IBM front-end processor or IBM host.

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DEC to push DECnet as backbone for SNA

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Cluster controllers, which are PU 2 devices, will only route traffic to PU 4 or PU 5 devices. In addition, emulating a PU 4 or PU 5 device will enable the SNA Portal to route traffic on a peer-to-peer basis directly to an IBM front-end processor or mainframe.

"DEC is starting to line up the correct pieces to allow this functionality to occur," said Mark LaRow, senior manager with Fairfax, Va.-based Network Strategies, a consulting practice of Ernst & Young.

Currently, DEC offers the DECnet/SNA Gateway, a stand-alone device that emulates a cluster controller and converts DECnet protocols to SNA. However, the DECnet/SNA gateway must be attached to both DECnet and SNA backbone networks, and it does not support SNA peer-to-peer communications.

The SNA Portal will enable DECnet users with remote offices outfitted with both a VAX and an IBM cluster controller supporting attached 3270 terminals to merge SNA and DECnet traffic on a single link, said Dale Kutnick, president of the Meta Group, a consulting firm in Westport, Conn.

Currently, those users link the VAX to the central site via a wide-area DECnet connection, while the cluster controller is linked via a separate SNA link to an IBM host.

Because SNA Portal can appear as a peer to IBM front-end processors, users can also employ it to link those devices, thus replacing the multitude of SNA links currently connecting those front-end processors, Wendler said.

However, analysts questioned whether DECnet will provide the same performance and data throughput of SNA links at an economical price.

"The big question with DECnet is whether you can build a DECnet network that can efficiently support the interactive transaction traffic that 3270 terminals and applications generate," LaRow said. "DECnet networks are used to handling relatively small packets of information."

Kutnick agreed. He said the processing overhead involved in squeezing SNA packets into DECnet will slow the network. "You'll always be less efficient running something inside of something else. I don't care if it's SNA inside DECnet or DECnet inside SNA."

Also factoring into the SNA Portal strategy is DEC's announcement last week of its VAX 9000 mainframe.

The VAX 9000, which DEC hopes will initially keep its current customers from swapping out high-end VAX minicomputers for more powerful IBM mainframes, can be configured to run SNA Portal software, Wendler said.

This will enable the VAX 9000 to act as if it were an IBM front-end processor, stripping away SNA packets from DECnet and routing them to the IBM host to which the packets are addressed.

Senior writer Paul Desmond contributed to this story.

Coaxial analyzers make life a lot easier

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be extremely valuable in determining a malfunction because it lets a technician see if the sequence numbers in the header are wrong or if transmission indicators were set incorrectly. It also enables a user to view the exact error code.

A multitude of DFT products have hit the market in the past five years, and they aren't just from IBM. We have seen 3270 emulators that support up to five sessions, local network gateways that use coaxial cable, LU 6.2 coaxial drivers and even a coaxial 3270 emulator that can toggle to LU 6.2 applications. This had made it convenient, if not essential, for mainframe installations to have a coaxial scope.

One particularly nice product is called CoaxScope, made by AZURE Technologies, Inc. of Franklin, Mass. It consists of a printed circuit board that plugs into any standard personal computer and a diskette with the software to drive it. To install the software, the user only has to copy the files from the floppy disk to a hard disk. On the back of the board are two standard BNC connectors; the user just attaches a cable from the 3174 to the board and another from the board to the terminal.

In a recent test of the product, my coworkers and I found it easy to use. Whereas other analyzers only display machine-coded data, the CoaxScope's DFT data was decoded. However, more of the SNA data could have been decoded, such as function management headers or some of the BIND session initialization requests.

In addition to DFT, the coaxial scope can analyze CUT traffic, as well as cables supporting signals from 3299 or compatible multiplexers.

Quick response pays off for store owners

continued from page 17

with about 300 vendors by the end of the year, and that number is expected to grow to 4,000 by the end of 1991, he said.

Sears is sending sales and inventory information to 94 vendors in a Quick Response setup, Ferkenhoff said.

"In men's workwear, we are on a Quick Response program using three suppliers with the commitment to ship merchandise within 72 hours after receiving our order," he said. "And with several large appliance and furniture sources, we are directly linked during the point-of-sale transaction to verify product availability, reserve the merchandise and schedule delivery."

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Worth Noting

"There are currently 65 named viruses. Most of them are less than 2 years old. In the two years since the first one was named, no one has been able to eradicate a single virus."

David Stang
Consultant
National Computer
Security Association
Washington, D.C.

Netnotes

Vance Systems, Inc. recently introduced a Remote Operation Option for its ATS 1000 local network analysis system. The system lets a network administrator dial into an ATS 1000-equipped local network to analyze its status.

The product was used in the multivendor Open Systems Interconnection interoperability demonstration at the recent Interop '89 exhibition in San Jose, Calif., where Vance used the tool in its booth to monitor the network in the multivendor booth.

All ATS 1000 features can be invoked by an administrator at a remote station, including: 100% data capture with simultaneous traffic emulation, real-time event tracing, protocol decoding, real-time performance monitoring and predefined data-capture experiments.

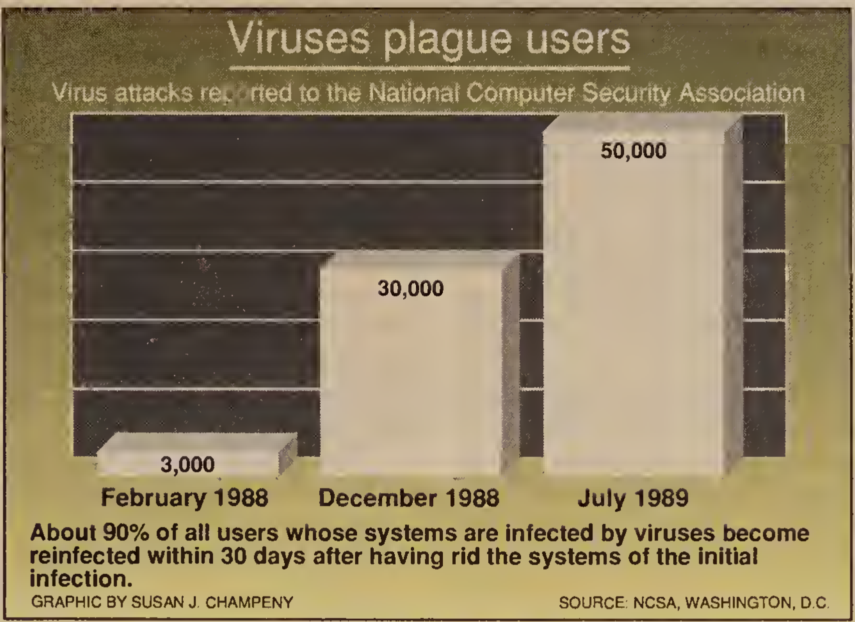
The ATS 1000 is available in models for each of the major IEEE local networks.

The ATS 1000 Remote Operation Option costs $1,395 for the primary system and $995 for each remote station.

Vance Systems is located at 3901-V Centerview Drive, Chantilly, Va. 22021; (703) 471-9402.

Relational Technology, Inc. next Monday is expected to unveil a back-end data base management system for local networks that is code-named Terminator and is based on the client/server architecture. The Terminator, named for the firm's ambitious plans to

(continued on page 20)


Viruses plague users

Virus attacks reported to the National Computer Security Association

About 90% of all users whose systems are infected by viruses become reinfected within 30 days after having rid the systems of the initial infection.

GRAPHIC BY SUSAN J. CHAMPENY

SOURCE: NCSA, WASHINGTON, D.C.

Rash of viruses puts spotlight on security

Although some viruses never materialize, the time to take adequate security measures is now.

By Laura DiDio
Senior Editor

The latest spate of publicity on computer viruses, while mostly misguided, has served one important purpose: It has heightened users' awareness of the importance of security.

While the virus alert on Friday the 13th turned out to be more scare than substance, the fact remains that there are three times the number of viruses and three times the number of reported incidents today than there were just a year ago.

In the first half of 1989, there were 50,000 reports of virus attacks or suspected attacks. And the upward spiral of viral infections shows no signs of abating, according to David Stang, a consultant at the National Computer Security Association (NCSA) in Washington, D.C.

In response, most users are reexamining their security practices. And despite the lack of a foolproof method to defend against viruses, worms, Trojan horses and logic bombs, users say they are taking a commonsense approach to computer security.

Typical of most users is Marjorie York, chief of the Intelligence and Security divisions at the Information Systems Software Center at Fort Belvoir, Va., a military post in Washington, D.C.

York is taking a proactive approach to network protection. "We're advising our 600 PC and network users to take certain routine steps to minimize the threat of a virus attack. Those precautions include performing multiple data backups [and] not using shareware or bulletin board software. We've also told our staff not to bring software from home since that too is often a source of many viruses," she said.

While Fort Belvoir's Information Systems Software Center has thus far successfully avoided viral infection, the center was kept busy during the last few weeks helping other agencies on the base rid themselves of viruses.

Jim Vavrina, a computer security specialist in the center, discovered that the Jerusalem virus had infected 43 personal computers at the Center for Night Vision's Scientific Engineering Management Computer Office, a lab on the Fort Belvoir base that develops night vision devices for the Army. The virus was contained in a commercial software demonstration program.

"We've told our staff not to bring software from home," York said.

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The Jerusalem virus caused files to grow in size, consuming memory, but was discovered before it could do any real damage. While the Center for Night Vision's systems have been cleaned, the group is now taking extra precautions.

"We scanned our entire lab, which has about 500 PCs," said Thomas Shapiro, a consultant at the center. "And we've put out a number of bulletins to our users advising them about the virus. We are also filtering all software that comes into the lab and are strongly discouraging use of bulletin boards. We've told our people

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Academics at Educom'89 lament cost of technology

Future of education depends on affordable nets.

By Laura DiDio
Senior Editor

ANN ARBOR, Mich. — The often prohibitive cost of networking was a major concern discussed by users in the academic community at the recent Educom'89 conference here.

The 25th annual Educom conference, held at the University of Michigan, drew about 3,500 attendees from 600 colleges and universities, the largest crowd since the conference's inception in 1964.

The conference is designed to give academic technologists an opportunity to explore common concerns and discuss network technologies and information system strategies.

At the keynote speech, IBM Chairman John Akers challenged conference goers to find ways to make the latest technology available to all U.S. colleges and universities, not just the elite 10% that have money on hand or receive large endowments.

"The nation faces no issue more important than a properly educated society," Akers said. "As Lyndon Johnson said in addressing the 1964 graduating class of the University of Michigan: 'Poverty must not be a part of learning, and learning must offer an escape from poverty.' "

Akers continued, "In the 1990s, we need to create an entirely new dynamic system of education . . . based on leading-edge computer and networking technology that is available to all institutions, regardless of size or location."

Akers' speech underscored the technology chasm between the haves and have-nots in the field of education. Carnegie-Mellon University in Pittsburgh, for example, is in the process of installing a 10,000-node experimental network with the help of IBM, while the University of South Dakota in Vermillion, S.D., is struggling to get workstations for students.

Talk is not money

Users attending Educom applauded the spirit of Akers' speech but said good intentions can't change the fact that many schools just don't have the money for computing and communications equipment.

According to John Bucher, director of the Computer Center at the University of South Dakota, "It's hard for us to sell professors and students on the benefits of local nets when they don't have anything on their desktops to network."

But even those that can afford to link campus devices often can't afford to participate in larger regional or nationwide networks.

(continued on page 20)

Meet runs smoothly with campuswide net

ANN ARBOR, Mich. — The 3,500 attendees at the recent Educom'89 conference here were able to keep in touch thanks to a sophisticated campuswide messaging network called InfoNet.

Some 130 workstations — including 65 Apple Computer, Inc. Macintosh IIcxs and 65 IBM Personal System/2 Model 50s — were installed in prominent locations throughout seven buildings on the University of Michigan's campus here, as well as in 22 area hotels.

The Macintoshes, which were connected to a mainframe in the university's computing center, enabled the attendees to use preassigned passwords to send and receive electronic mail, and to receive updated information on conference events. Since the school is a member of the nationwide Internet and BitNet networks, attendees could also send messages to their remote offices.

The IBM Personal System/2s, which included an InfoWindow Touch-Display Monitor, presented users with informational videos about Educom'89 events.

In addition to the data net, Educom'89 made a voice mail service available to attendees to send and receive messages on any push-button phone using a preassigned number.

Educom President Kenneth King said that, although pieces of InfoNet technology have been used before at other conferences, this is the first time that both voice and data services have been available to conference attendees.

— Laura DiDio

Racal-Vadic unveils new short-haul modem family

By Susan Breidenbach
West Coast Bureau Chief

MILPITAS, Calif — Racal-Vadic introduced a line of short-haul modems here last week that can be used to transmit data within company facilities in a point-to-point or multipoint fashion.

The Com-Link 7 modems support full- and half-duplex, asynchronous or synchronous transmission at speeds ranging from 1,200 bit/sec to 19.2K bit/sec. They are compatible with the CCITT V.24/Bell 43401 short-haul communications standard and, with prices as low as $425, are being billed as a price/performance breakthrough.

The modems operate over four-wire, dedicated lines at distances of up to 15 miles.

Built-in diagnostics enable self tests, remote tests and end-to-end tests for isolating system faults. Operators at either end of a point-to-point line can place a remote Com-Link 7 modem in a digital loop-back mode to test the modems and the line.

To facilitate distortion-free data transmission, the modems incorporate delay modulation and automatic adaptive equalization techniques.

> Delay modulation squeezes the transmission to where distortion is minimal.
>
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Delay modulation squeezes the transmission down to the center, or sweet spot, of the 300- to 3600-Hz short-haul bandwidth, where distortion is minimal. Adaptive equalization dynamically adjusts the transmission to the line quality and receiving signal, minimizing the effects of line or envelope delays, echo, frequency offset and phase jitter.

The Com-Link 7 modems operate synchronously at nine switch-selectable data rates. To enable interactive communications between personal computers and an asynchronous host, an asynchronous mode is available as an option.

When used with Racal-Vadic's multiplexers, the modems act as port extensions, allowing remote personal computers or other terminals as far as 15 miles away to share a common, long-haul circuit for multiplexed data transmission to a central host.

The new line of modems consists of the Com-Link 7 SA, a stand-alone desktop model priced at $475, and the Com-Link 7 CS, a rack-mounted card priced at $425. The asynchronous communications option for either model costs an additional $50.

Rash puts spotlight on security

continued from page 19

that they are responsible for doing standard, daily backups,'' he said.

''We're not panicky or laid-back. We're cautious and have a heightened awareness of computer security,'' York added.

Randy Watjen, a systems programmer at Vanderbilt University Medical Center in Nashville, which has not fallen prey to any virus, voiced similar sentiments. All the publicity about viruses, he said, has simply underscored the need for computer and network security.

''Viruses and other malicious security breaches are not something we can laugh off. It's like AIDS; it's a reality, and we have to deal with it,'' Watjen said.

Watjen's method of minimizing the threat of infiltration is to practice basic computer security on a daily basis. ''On a personal level, for instance, whenever I lose visual contact with my terminal, even if it's only going to be for a few minutes, I lock it up and no one can use it while I'm gone,'' Watjen said.

''Security and viruses are the topic of constant discussion both on the academic and the medical side of Vanderbilt University,'' he continued. ''So far, we've been lucky and we've managed to avoid the problem, but we've always got our eyes open.''

> ''Viruses and other security breaches are not something we can laugh off,'' Watjen said.
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While most users take a pragmatic approach to combating viruses and avoiding security breaches, the NCSA's Stang notes that extremists, who either panic or do nothing to protect their systems, comprise a small percentage of the user population.

At one end of the spectrum, Stang said, the NCSA receives calls from users who interpret a software glitch — often wrongly — as a virus. At the other extreme are users who take a laissez-faire approach to the issue of security, ignoring the dangers and eschewing even the most basic security measures, such as installing password protection. ''These are the users who say, 'It will never happen to me' and then they wake up sadder and wiser,'' Stang said.

''The fact is, computer viruses aren't going to go away. Our research shows that 90% of all systems that have been hit by viruses will suffer another infection within 30 days,'' Stang said. ''Users have to take responsibility for making their systems and nets secure or suffer the consequences.''

Those users who suspect that their systems or networks have been hit by a virus can call the NCSA's hot line for assistance at (800) 843-4850.

Academics lament cost

continued from page 19

Michael Staman, associate vice-president of information services at West Chester University of Pennslyvania in West Chester, said he has had difficulties persuading the people who control the university's purse strings to provide funding to join regional and national research nets.

Participation in such networks would provide small users with access to an array of scientific, engineering, technical and library data bases.

''I try to sell my superiors on the idea of spending tens of thousands [of dollars] to join a regional network, [but] they're still not at the point where they understand the collaborative principle of local nets,'' Staman said.

The critical question facing developers of regional or statewide networks is how to serve all universities and research colleges, noted Gary Auguston, executive director of computer and information systems at The Pennsylvania State University in University Park, Pa.

Auguston said recent statistics show that about 250 academic institutions nationwide are linked into the National Science Foundation (NSF)-sponsored BitNet electronic mail network, but only about 24 of the participants are small colleges and universities.

The reason small colleges and universities are not joining is the cost. ''The typical cost of membership in a statewide or regional network ranges from $10,000 to as high as $50,000. Most institutions just can't afford that kind of money,'' Auguston said.

And the staggering $500,000 price tag of joining a nationwide network such as the NSF BitNet network is well beyond the financial means of 90% of colleges and universities, he said.

''I might as well ask for a trip to the moon,'' said the director of a computer center at a small Southern college who asked not to be named. ''We consider ourselves lucky when we get the money for PCs.''

Some states are taking steps to see that smaller colleges and universities are supported by regional and even national networks.

Equal opportunity

Last year, Pennsylvania established the Pennsylvania Research & Economic Partnership network (PREPnet), a high-speed backbone linking the state's colleges, universities and public-sector research institutions.

A key condition in getting state funding for PREPnet, Auguston said, was that ''PREPnet had to provide all state universities and companies with access to the nationwide Internet network and not be just a private club for large, cash-rich universities.''

Netnotes

continued from page 19

compete against Oracle Corp., will support front-end data base systems such as the Ashton-Tate Corp./Microsoft Corp. SQL Server, a company spokesman said.

Unison Technologies, Inc. will introduce at Comdex next month three new uninterruptible power supply products, as well as uninterruptible power supply-monitoring software for local networks running Novell, Inc.'s NetWare.

As their names suggest, the UniPower MPS800, MPS1200 and MPS1500 provide 800 volt amperage (VA), 1200VA and 1500VA of on-line, sine-wave conditioned power for net file servers or other systems running critical applications.

Unison's new monitoring software, called 2nd Chance, runs on NetWare servers as a value-added process. When a power failure or low-battery condition occurs, the UniPower product signals the NetWare server via a serial port, and 2nd Chance then broadcasts warning messages to all network users before initiating an unattended server shutdown.

Available in January, the MPS800, MPS1200 and MPS1500 are priced at $1,099, $1,699 and $2,199, respectively.

Unison Technologies is located at 23456 Madero St., Mission Viejo, Calif. 92691; (714) 855-8700.

To get information on products or services advertised in this week's issue of *Network World,* see the FAXNeT Form on Page 65

FAXNeT

MANAGEMENT STRATEGIES

MANAGING PEOPLE AND TECHNOLOGY: USERS GROUPS AND ASSOCIATIONS

Dialogue

What effect has the San Francisco earthquake and hurricane Hugo had on your disaster planning?

“By reading the industry trades, we've gotten a very good taste of exactly what happened in San Francisco. And a lot of the stories were success stories [that came about] as a result of good planning.

“I know that at Bear, Stearns, for example, we were able to [have our San Francisco office] up and running at 100% [capacity] within eight hours of the disaster. We were able to reroute our Pacific Basin networks [from San Francisco] through Los Angeles. I think [these recent experiences prove that] a lot of people have recognized the importance of disaster recovery planning.”

Jeff Marshall
Managing director,
communications services
Bear, Stearns & Co., Inc.
New York

“Hugo and the San Francisco earthquake demonstrate yet again that all the [disaster recovery] work we do is absolutely essential.

“The Commonwealth has a very proactive approach to disaster recovery. But nontechnical people sometimes have trouble understanding [why we do this]. Earthquakes and hurricanes demonstrate, in a very visceral way, how important the planning process is.”

Len Evenchik
Director of data
communications
Commonwealth of
Massachusetts
Boston

“They have reinforced the idea that you better not have all your eggs in one basket. Users need to support a multitude of communications pathways for voice and data, including radio, microwave and satellites.

“We have already started planning to increase our use of fiber and provide alternate routing for our voice and data traffic. We are also looking at using very small aperture terminals, which would enable us to restore service during an outage much more rapidly.”

Norm Martin
Director, Office of
Telecommunications
Management
Department of General Services
State of Maryland
Baltimore

Users install proprietary nets, wait on MAP/TOP

Lack of products forces users away from standard.

By Barton Crockett
Senior Editor

Some of the country's staunchest MAP/TOP proponents say a dearth of products supporting the standard is forcing them to install proprietary networks.

Among those forced into this position is The Boeing Co., a Manufacturing Automation Protocol/Technical and Office Protocol pioneer. Last spring, the Seattle-based airplane maker announced it will use Ethernet products, rather than MAP 3.0-compatible gear, as the principal means of networking computers in a major new sheet metal factory (“Boeing taps DEC for big systems integration job,” *NW,* March 27).

Likewise, Moline, Ill.-based Deere & Co., which helped organize last year's Enterprise Networking Event '88 in Baltimore, a MAP/TOP showcase, is planning to use a proprietary network to support a labor-tracking application in one of its North American factories.

Executives at both companies said they were forced to use proprietary networks because not enough products supporting Version 3.0 of the MAP network standard were available.

“There's no doubt that a shortage of MAP/TOP 3.0 products exists,” said Gary Blunck, a computer-integrated manufacturing project manager in Deere's technical services division. “If you have the wrong combination of requirements, you can't have a [3.0] network.”

Incomplete product line

Among the many notable MAP/TOP 3.0 product holes, according to Blunck, is MAP/TOP 3.0 products for Sun Microsystem, Inc. workstations. “I can't think of a single MAP/TOP 3.0 product for Sun workstations,” he said.

Blunck said he is asking Sun workstation users to send him their requirements for MAP/TOP 3.0 products so he can present them to Sun and encourage the vendor to offer more MAP/TOP support.

Blunck also complained about a lack of MAP/TOP 3.0 products for IBM computing environments, including the Personal System/2, 9370 and Application System/400 computer lines.

Laurie Bride, manager of network architecture at Boeing Computer Services Co., a division of Boeing, and chairwoman of the U.S. MAP/TOP Users Group Steering Committee, cited a lack of MAP/TOP 3.0 interfaces for Digital Equipment Corp. computers.

Blunck added that while recent MAP/TOP 3.0 product announcements by IBM and DEC have helped fill in some of the

(continued on page 24)

GUIDELINES

BY IRA BRODSKY

Training software can be viable seminar alternative

Rarely can members of a corporate network staff afford to abandon their posts for three days to attend off-site training seminars. But the need to stay on top of ever-changing network technologies seems to dictate that they should. However, personal computer-based training software offers a powerful alternative to live seminars for keeping network staffers technically up-to-date.

Authors of computer-based training (CBT) software use personal computer-based graphics, sound and animation to make learning network technologies interesting. Some CBT packages even challenge students to use simulated test equipment, such as bit error rate testers, to analyze simulated networks.

A primary advantage CBT offers over seminars is cost. A typical three-day seminar can cost more than $1,500 if travel, registration, food and lodging costs are factored in. Add to that the loss of valuable time from the office, and seminars can

(continued on page 24)

Brodsky is president of Datacomm Research Co., a Wilmette, Ill.-based consulting firm.

MANAGEMENT PROFILE

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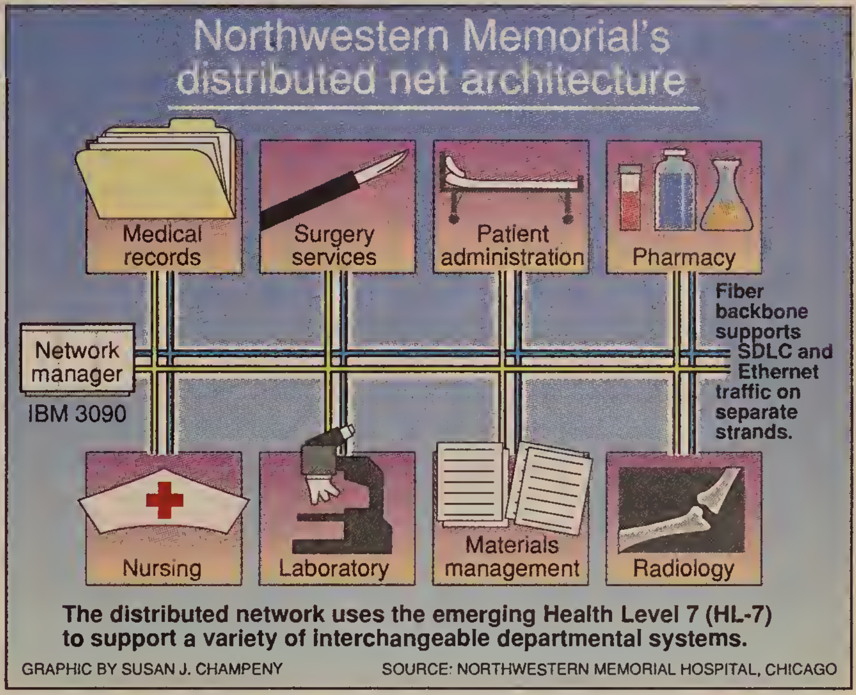
BY WAYNE ECKERSON



The distributed network uses the emerging Health Level 7 (HL-7) to support a variety of interchangeable departmental systems.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: NORTHWESTERN MEMORIAL HOSPITAL, CHICAGO

Hospital looks to distributed net cure

Northwestern Memorial moves to standard net to give users more flexibility in choosing equipment.

CHICAGO — Northwestern Memorial Hospital is implementing a standards-based distributed network architecture that promises to give end users greater flexibility in choosing systems that best meet departmental needs.

Based on an emerging health care industry standard called Health Level-7 (HL-7), the architecture will improve the productivity of nurses and physicians by giving them quick access to patient information — such as blood test results, radiology reports and registration data — from any vendor's system on the network.

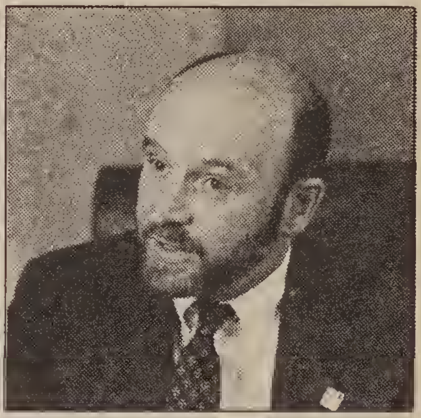
According to Richard Bretagne, chief information officer at the 750-bed teaching hospital here, the network will utilize a new fiber backbone that will interconnect information systems used in more than 40 hospital departments, including laboratory, pharmacy and radiology (see graphic, this page).

The network, which will be cut over next spring, will replace a centralized single-vendor information system the hospital has used for 10 years.

The network of choice

By requiring vendors to conform to the HL-7 protocol, the new network will allow end users to install systems of their choice. Currently, end users must purchase IBM-compatible systems or implement costly custom interfaces to connect their standalone systems to the shared network. The HL-7 protocol pertains to the application layer of the Open Systems Interconnection model and borrows from several proprietary and standards-based protocols used in existing health care applications.

“The new architecture gives our end users the decision-making power to implement the best systems for their departments. Each of our departments has distinct requirements that a single shared system can't possibly meet adequately,” Bretagne said.



Richard Bretagne

The distributed network will connect departmental systems linked to the dual-fiber backbone, which will carry IBM's Synchronous Data Link Control and Ethernet traffic on separate fiber strands. An IBM 3090 processor, which now serves as the host of the hospital's centralized system, will route information and messages between departments.

The Ethernet backbone will be used to support Ethernet-based departmental systems, such as a Digital Equipment Corp. VAX 6000 processor running Sunquest Information Systems, Inc.'s

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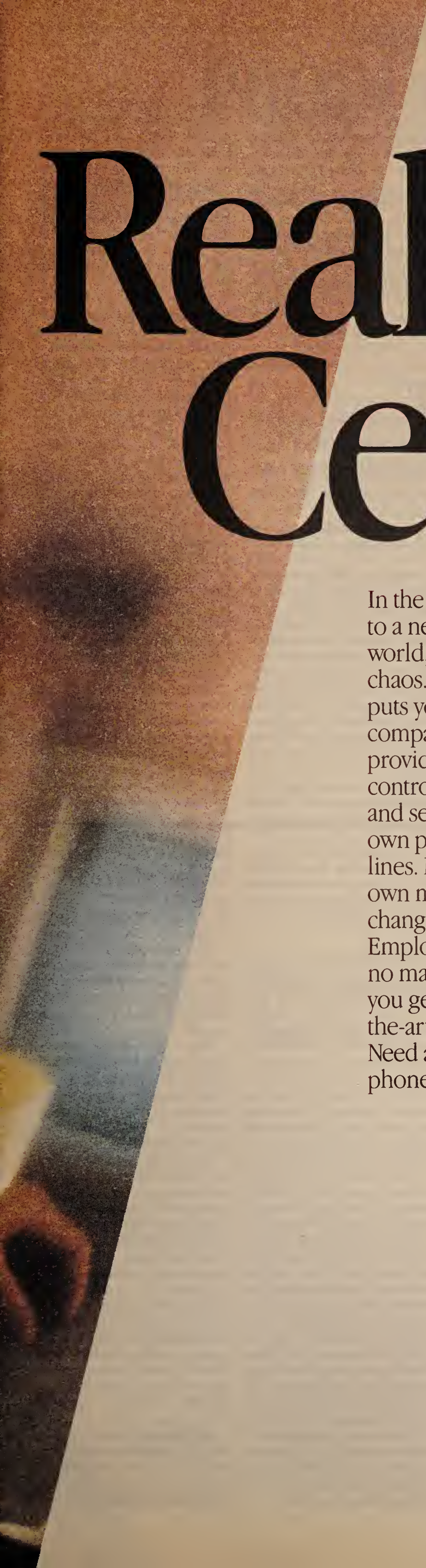

Real-World Centrex.

In the tidy world of diagrams, nobody ever moves to a new office. Or changes jobs. But in the real world, moves and changes create telephone chaos. Where can you find a phone system that puts you back in control? At your local phone company. With advanced Digital Centrex Service provided from the Central Office, you get to control, assign and service your own phone lines. Make your own moves and changes. Right from your own premises. Employees get to keep the same phone number no matter where or how often they move. And you get to keep your sanity. All thanks to the state-of-the-art 5ESS® Switch from AT&T Network Systems. Need a change? Make a move. Call your local phone company.

You and Your
Local Phone Companies

AT&T
Network Systems

Health care examines net options

By Wayne Eckerson
Staff Writer

CHICAGO — Health care professionals at a recent conference here debated whether hospitals should adopt a multivendor or single-vendor information system strategy.

Many users and suppliers attending the "Computers and Communications Systems in the Healthcare Industry" conference said distributed networks that support equipment and applications from a variety of vendors better serve the needs of individual hospital departments.

Some conference goers, however, said users benefit more from hospital information systems provided by a single vendor. Such systems are more cost-efficient and are available now, they said. Multivendor hospital networks, on the other hand, require the use of health care communications standards that have yet to be universally adopted.

The conference was organized by Frost & Sullivan, Inc., a New York-based market research and consulting firm. It was cosponsored by The Kennedy Group, a health care systems consultant in Redwood City, Calif., and the Healthcare Information and Management Systems Society, an association of health care information system managers.

Proponents of a multivendor strategy said it gives end users in different departments greater flexibility in selecting the products that meet their requirements. A single-vendor approach locks users into a limited range of products that may not meet their unique needs, they said.

"You can't buy [an integrated, open network] today," said Ben Holmes, vice-president of Hewlett-Packard Co.'s Medical Products Group in Andover, Mass.

Holmes said it will take five to seven years before a significant number of health care institutions are able to build integrated, multivendor networks based on industry standards.

Moving to the future

In the future, Holmes said, hospital networks will integrate all health care systems within a facility, as well as those used by affiliated patient care facilities, including physician offices, outpatient clinics and nursing homes.

Many users have already begun moving to establish such integrated networks (see "Hospital looks to distributed net cure," page 21).

North Memorial Medical Center in Robbinsdale, Minn., recently said it will abandon its single-vendor strategy and eventually migrate to a multivendor net, according to David Cress, chief financial officer at the hospital.

A multivendor approach is more appealing given the medical center's decentralized management philosophy, which gives department heads greater responsibility for running their areas, Cress said.

"We're going to keep our end users happy," Cress said. "They are sophisticated specialists who know best what systems meet their needs."

Cress said many users complained that the medical center's current single-vendor system does not provide the functionality or flexibility they desire. Consequently, the center's information system staff often ends up rewriting programs for end users.

He said a multivendor network will initially cost more to operate, and it may be cumbersome for users accessing data from different systems. The center will need to implement expensive interfaces between vendor systems, as well as specialized software that will enable top management to extract and merge data from various systems to make management decisions.

Brigham and Women's Hospital in Boston last year began moving to a multivendor system, in part to minimize the risks of relying on a single vendor for all software and support.

"It's too risky to use a single vendor. That vendor could go bankrupt or decide not to support or adequately enhance your system," said Victor Yick, a vice-president at the hospital, which is a teaching affiliate of Harvard Medical School.

Yick said a multivendor approach would also give end users greater leeway in purchasing systems of their choice.

But not all conference goers agreed that implementing a multivendor hospital network would benefit users.

Ed Pisinski, vice-president at Medical Information Technology, Inc., a health care systems supplier in Westwood, Mass., said single-vendor solutions are more cost-efficient because users do not have to implement costly interfaces to multivendor systems.

Pisinski said a single-vendor system can offer users hospital-wide access to integrated patient information on a consistent hardware and software platform. Moreover, he said, these systems are available now. "Single-vendor systems provide users with the best bang for the buck, and they provide a host of benefits," he said.

Such systems simplify a network manager's job, Pisinski said. With a single-vendor system, network managers only need to negotiate a contract with one vendor, which saves time and money. Also, managing a multivendor network can be difficult and service can be slow because the user must determine which gear is at fault.

Hospital looks to net cure

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laboratory system, which is scheduled to be implemented next spring.

The Systems Network Architecture backbone will support departmental applications running on IBM systems, which will include an IBM Token-Ring Network in Surgery Services and an IBM Application System/400 minicomputer in Materials Management. These two systems are also slated to replace existing systems next spring, Bretagne said.

Northwestern Memorial has contracted Interlink Group of San Jose, Calif., to provide a network interface between the Ethernet and SNA backbones. The hospital will build additional interfaces if other network protocols need to be used on the backbone, Bretagne said.

Unlike the current setup, all data will reside on departmental processors instead of at the host. Currently, departments periodically download data to the host, where it is then accessed by other users. The new architecture, on the other hand, will enable users to access up-to-date patient data directly from any system on the network, Bretagne said.

The dual backbone will allow the hospital to maintain its host-based applications while gradually phasing in systems from other vendors, Bretagne said. It will also let departments retain their IBM host-based applications if they wish. Eventually, all departmental systems will be swapped out, some before the network is completely finished, Bretagne said.

"The beauty of the architecture is that it will allow us to plug systems in and out of the network as needed. This flexibility will enable the hospital's end users to purchase the most advanced systems and leading-edge technologies as soon as they become available," Bretagne said.

The new architecture will enable users to access patient data from any system on the net.

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Anticipating the development of advanced multimedia clinical applications that require large bandwidth, such as radiological image transfer, Northwestern Hospital's network managers decided that a fiber backbone made the most sense. "We won't have to change media to implement [Fiber Distributed Data Interface]," said Michael Pertell, manager of technical services at the hospital.

Despite the advantages the distributed net presents, it's not without its drawbacks. For starters, Northwestern Memorial will need to spend $1.7 million to build the network's infrastructure. That price tag includes the cost of cabling, fiber, terminal controllers, front-end processors and other equipment. Future expenditures will be determined by the nature of the applications that departments wish to implement, Bretagne said.

No common user interface

In addition, departmental applications will not share a common user interface. This means physicians, nurses and others who need to access data from multiple departments will have to learn six or more different sets of commands and displays, Bretagne said. While the hospital will need to devote considerable resources toward training, he said the lack of a common user interface will not deter staff from taking full advantage of the network capabilities.

"Since we are an academic medical center, our clinical staff is entirely capable of learning multiple interfaces. The information on the systems will be the same; it will just be presented differently," Bretagne said.

Despite the obstacles, Bretagne is confident the hospital's distributed multivendor architecture will succeed. "The new network will enable users to select systems they want," Bretagne said. "We no longer have to play the traffic cop or stopper."

Users wait on MAP/TOP

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gaps, major MAP/TOP product holes still remain.

The difficulties these users have with finding MAP/TOP 3.0 products is stirring up debate among MAP/TOP supporters.

Some MAP/TOP advocates, such as Bride, advise users concerned about the lack of products to go ahead and implement proprietary networks now and convert to MAP/TOP 3.0 later.

"You would have to be very persistent to carry through with MAP/TOP 3.0."

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"As a user, you would have to be very persistent to carry through with a [MAP/TOP 3.0] implementation at this time," Bride said.

"In some cases, this is simply too risky for upper management to agree to," she explained.

A Boeing spokeswoman said that the company plans to eventually upgrade its sheet metal network from Ethernet to MAP 3.0 once products based on the Open Systems Interconnection standard mature and become more widely available.

The flip side

Other MAP supporters, such as Michael Kaminski, manager of networking technology at Detroit-based General Motors Corp., urged users to ignore the product shortfalls and charge ahead with MAP 3.0 implementation.

"If you're planning to install a particular [network] technology in a factory, you're looking, on average, nine to 18 months into the future," Kaminski said.

"If you tell me you can't find a vendor to support MAP 3.0 in 18 months, I'll tell you you don't know what you want to install."

Kaminski acknowledged, however, that users will probably have to wait about two years before enough TOP 3.0 products become available to make extensive implementations feasible.

In the meantime, several MAP/TOP supporters said they will be forced to grapple with the uncomfortable implications of advocating a standard that is not adequately backed by products.

"I hope you're writing a story telling the vendors to get on with it," Bride said. "I know several users that are finding this situation quite frustrating."

Software can be viable alternative

continued from page 21

become quite an expensive proposition.

CBT packages almost always cost less, particularly when the cost is spread out across an entire network department. In addition, there is no travel to seminars involved.

With CBT packages, students learn and review concepts whenever they want. In the future, network managers will be able to monitor their network staffs' progress by loading CBT packages on local nets.

What features should CBT users look for? First, courses should be divided into easily digested and logically distinct modules. They should allow the student to log off and log back on to the same spot later. This logoff/logon feature is referred to as a bookmark.

Of course, CBT packages aren't a panacea. Probably the biggest drawback is that there just aren't enough of them, particularly for newer subjects such as Open Systems Interconnection and Fiber Distributed Data Interface.

But for many network managers, CBT packages provide a relatively inexpensive and effective means for keeping a network staff up to speed.

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

Worth Noting

Next week: Concerned with enterprisewide connectivity? Examine *Network World's* datacom Buyer's Guide on mid-range network test equipment.

First Look

TRW releases fax encryption device

TRW Electronic Products, Inc. recently announced an encryption device for Group III facsimile machines. The **TRW Fax Encryptor** enables users to protect information sent by fax from being illegally monitored through a wiretap. The unit encrypts each fax transmission with a unique algorithm that can be decoded only by a TRW Fax Encryptor at the receiving end.

With the TRW Fax Encryptor, users are not required to physically distribute algorithm codes to all parties that receive classified information by fax. Instead, the unit automatically creates new algorithm codes for each fax.

Each TRW Fax Encryptor is equipped with a unique identification code based on each unit's serial number. When sending secure data, the units automatically identify themselves using this code. Once the session has been authenticated, the units create a unique algorithm that encrypts the transmitted data. After the transmission is completed, the code is erased.

Each encryption device can store as many as 100 identification codes of other TRW units. The devices can send encrypted data only to those devices listed in its directory.

The TRW Fax Encryptor allows transmissions at speeds up to 9.6K bit/sec. The unit attaches to a Group III fax machine and a phone line via two standard RJ-11 jacks.

The product costs $1,595.

TRW Electronic Products, Inc., 1050 Southwood Drive, San Luis Obispo, Calif. 93401; (805) 544-2438.

Data base supports 255 nodes

By Tom Smith
New Products Editor

EL SEGUNDO, Calif. — Advanced Software Technologies, Inc. recently upgraded its Magix local network data base software to support more than twice the number of nodes, allow MS-DOS to coexist on a workstation and support IBM's Micro Channel architecture.

Magix Version 4.0, like earlier releases, has two components: a workstation component for Ethernet-attached devices based on Intel Corp. 8086, 8088, 80286 or 80386 processors, and a server component for microcomputers based on 80286 or 80386 processors that have an AT-style bus and a 20M-byte hard drive.

The software comes in two versions, Development and Runtime. The Development version consists of a "Factory" that is used by both value-added resellers and end users for developing Magix applications, while Runtime is the portion required for end users to run applications developed in the Factory.

Magix, which has been offered since 1983, could support only 96 Ethernet workstations, according to company President Patrick Panzarella. The new version supports 255 workstations.

In earlier releases of Magix, MS-DOS could not coexist on the workstation running Magix. As a result, a user in a Magix session who wanted to exit to DOS had to log off and reboot the workstation. Now, users exiting Magix will receive a DOS prompt.

Also with the upgrade, the software can run on IBM Personal System/2s based on the Micro Channel architecture. Prior to this release, Magix ran only on IBM Personal Computers or compatibles.

> The software can run on Personal System/2s based on the Micro Channel architecture.

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The multiuser Magix data base offers users performance advantages over single-user local net data bases, according to Panzarella. For example, it can process a complex data query and return a single response.

Single-user local net data bases, by contrast, dissect a data request, such as "all customers with a credit limit in excess of $5,000," and respond to each subsection with individual answers: a list of all customers, a list of customers with a credit limit and so forth.

Such an approach increases network traffic and server over-

(continued on page 27)

Wire hubbing device ties wide range of equipment

CHATSWORTH, Calif. — Fibermux Corp. last week introduced the Crossbow, a network hubbing device designed to accommodate a range of multiport interfaces for different types of equipment.

The Crossbow chassis, the FX6600, holds 11 interface modules, each of which has 10 ports.

Modules available in the initial release include the CC6613Z, which supports unshielded or shielded twisted-pair wire links to Ethernet-compatible devices, and the CC6615Z, which supports fiber-optic Ethernet links. A third module, the SmartLink, gathers network management information collected from the other interfaces and sends the data to a management console.

The CC6613Z Ethernet interface for shielded and unshielded twisted-pair wire supports cable runs of 100 meters between the chassis and Ethernet nodes. CC6615Z enables fiber runs of up to three kilometers between the chassis and Ethernet workstations.

Crossbow modules to be released by year end include interfaces for token-ring devices, IBM System 3X and Application System/400 minicomputers and terminals, as well as interfaces for a variety of other types of Ethernets. Also pending is the release of network management software called LightWatch.

According to Emily Nagle Green, director of marketing at Fibermux, users can link 10 to 12 FX6600 chassis by using fiber-optic, twisted-pair or coaxial cable.

A higher number of hubs can be linked using Fiber Distributed Data Interfaces or third-party bridges, Green said. Modules in the same or differnet hubs can only communicate with like modules. An interface supporting to-

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Racal-Milgo expands CMS mgmt. family

CMS 400 supports up to 32,000 net devices; will replace Nucleus 200, aging 2000 products.

By Tom Smith
New Products Editor

SUNRISE, Fla. — Racal-Milgo recently unveiled an upgrade to its Communications Management Series (CMS) network management systems that significantly increases the number of devices supported.

The CMS 400, the company's latest package in its CMS line, enables users to configure, manage and monitor as many as 32,000 Racal-Milgo modems, time-division and statistical multiplexers, and data service units. It supports 512 diagnostic channels.

The system can also emulate a Digital Equipment Corp. VT-220 terminal, allowing users to manage Omnimux 8000 T-1 multiplexers and V.32 modems from the CMS 400 net management console. Previously, those products were managed on different systems.

CMS 400 will eventually replace the CMS Nucleus 200, introduced in 1988, which supports as many as 32 diagnostic channels and 512 devices. It will also replace the flagship CMS product, the CMS 2000, which can manage between 4,000 and 5,000 devices through its 256 diagnostic channels.

According to Frank DaCosta, senior technical analyst at Racal-Milgo, the CMS 400, which is

(continued on page 27)

Hand-held CPU for health care uses infrared net link

By Wayne Eckerson
Staff Writer

DES MOINES, Iowa — DFM Business Systems, Inc. recently announced a hand-held computer that enables users to access data from disparate networks using infrared technology.

The TraveLite 286 is a portable, Intel Corp. 80286-based microcomputer that lets users key in data and access files as they move throughout a building.

Companies can avoid the expense of equipping every office with a terminal or workstation by offering the portable to users who move about the company, according to the vendor.

DFM is initially targeting the TraveLite 286 for use by nurses and physicians working in hospitals who need to input and retrieve patient information as they make their rounds. DFM is a software developer and systems integrator based here.

A little help from a TVCU

The 3½-pound TraveLite 286 works in conjunction with a television control unit (TVCU), also sold by DFM. The TVCU is an intelligent terminal that relays infrared signals from the TraveLite 286 over a building's coaxial cable distribution system to a network server.

The server acts as a gateway to any data base on the corporate network, including IBM System/370 mainframes, Digital Equipment Corp. VAX minicomputers and Novell, Inc. NetWare local networks.

The TraveLite 286 has an infrared transceiver that beams data signals to a TVCU at a distance of up to 180 feet. The transceiver spreads the infrared signal in a 300-degree radius, so users need not know in which direction to point the device when transmitting or receiving information.

Hospital applications

The TraveLite 286 is initially targeted for use in hospitals, although it has applications in a variety of industries, said Robert Steinberger, DFM vice-president.

Once a hospital room is equipped with a TVCU, a nurse or physician making rounds can use the TraveLite terminal to access a variety of patient data stored in departments throughout the hospital. The requested data appears in multiple windows on the device's touch-sensitive screen.

The TVCUs can be attached to cable television sets in each room. The TVCU divides an unused television channel into four 56K bit/sec circuits that carry data over coaxial cable to a network server attached to a hospital's cable television distribution network. The TVCU doesn't interfere with the normal operation of the television.

Besides supporting gateways to other hospital systems, the network server packages data it gathers from disparate systems in

(continued on page 27)

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Pack links workstations to DEC VAXes, IBM hosts

By Tom Smith
New Products Editor

NEW YORK — Systems Strategies, Inc. recently introduced two software packages that allow a variety of workstations to communicate with Digital Equipment Corp. VAXes and IBM computers.

One product, ezBridge Peer-to-Peer, enables any IBM Personal Computer, Personal System/2 or 5250 terminal, as well as any DEC VT terminal that supports IBM's LU 6.2 and PU 2.1 protocols to establish a peer communications session in real time with DEC VAXes and IBM minicomputers and mainframes on the same network.

The other software package, ezBridge On-Line, establishes terminal-emulation sessions for users that need occasional access to the IBM and DEC computers. Both software products reside on workstations and hosts in the net.

The company said the products will predominantly appeal to the banking and financial arenas, allowing users with international networks to create universal workstations that can communicate with a variety of processors.

"That's where we've been getting a lot of demand," said Les Yeamans, vice-president of end-user products at Systems Strategies.

The ezBridge Peer-to-Peer software is an LU 6.2 tool kit used to develop transaction processing-based applications for reporting real-time data in Systems Network Architecture, DECnet, X.25 and Transmission Control Protocol/Internet Protocol nets.

The LU 6.2 protocol enables the user to establish peer sessions between workstations and IBM or DEC minicomputers and mainframes on the net. A workstation that supports LU 6.2 and PU 2.1 can access any information from an IBM or VAX processor that is also running the software.

The company said the products will appeal to the banking and financial arenas.

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Users do not have to log off their workstations and log on to the host as a dumb terminal to access the information they need; they can simply create a peer session from within their existing environment.

"We are insulating programmers from the technical details of LU 6.2 communications and allowing them to focus on the application," Yeamans said.

He added that a brokerage, for instance, could use ezBridge Peer-to-Peer to develop an application that continually updates stock prices on a workstation at the same time the stock updates are logged onto IBM or DEC computers.

On-line help

Users who do not need real-time financial information could use ezBridge On-Line to establish terminal-emulation sessions with a host and access information as needed. The ezBridge On-Line product establishes IBM 5250 or IBM 3270 sessions, depending on the processor being used. Systems Strategies plans to offer a VT terminal-emulation capability by year end.

With ezBridge On-Line, users log on to the computer on which the data needed is stored. For example, a loan officer at a VT terminal in an overseas bank could initiate a data base check to a remote IBM Application System/400 by emulating an IBM 5250.

Both products are available now. EzBridge Peer-to-Peer ranges in price from $7,000 to $20,000, depending on the processor used; ezBridge On-Line costs $5,000 to $15,000, also depending on the processor.

Systems Strategies can be reached by writing to 225 W. 34th St., New York, N.Y. 10001, or by calling (212) 279-8400.

Racal-Milgo expands CMS family

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based on an IBM Personal System/2, is more economical than the CMS 2000, which employs a Digital Equipment Corp. PDP-11 minicomputer.

Users can configure the network management system in two ways: It can be set up as a single Personal System/2 managing all devices on the network, or it can support as many as eight remote workstations — such as IBM Personal Computers or laptops — feeding information to a Personal System/2-based hub.

To reach the system's maximum device capacity, users must employ External Diagnostic Multiplexers (EDM), which have 16 75K bit/sec diagnostic channels. As many as 16 EDMs can be fed into two Distributed Diagnostic Multiplexers (DDM) at the net management hub, providing 256 diagnostic channels. The Personal System/2 can accommodate two DDMs, thus providing as many as 512 diagnostic channels.

The older CMS 2000 used a similar scheme to support its maximum number of devices, but the hardware used only supported synchronous data at 9.6K bit/sec. CMS 400, on the other hand, supports asynchronous data at speeds ranging from 1,200 to 19.2K bit/sec.

Smart software

A key feature of the new system is an "auto learn" capability that archives information, such as addresses from devices on the network, and automatically enters it into a data base on the Personal System/2. By contrast, with the Nucleus 200 system, users had to manually type such information into the data base.

Other information stored on the data base typically includes the serial number of a device, the type of device, the diagnostic channel address, the speed at which the device operates and the physical location.

In the event of a modem failure, for example, a network operator would use the data base to obtain pertinent data about the modem in question.

Built-in script files let users automate commonly executed functions, DaCosta said. And the system's scheduling capabilities allow users to run unattended functions at specific times.

A map graphically depicts the configuration of the network and provides basic information from the data base about each device. The map can include as many as 32,000 devices. Users can cut and paste network hardware to move it from one location to another, and they can also add devices or modify existing ones.

Open windows

The Personal System/2 screen has six windows: one is known as the fixed-function window and is used to invoke the functions represented by the other five windows. Those other windows include such information as the network map or line quality tests, which are disruptive tests initiated by the user to test analog line parameters such as phase jitter.

All of the windows can be operating simultaneously, DaCosta said. The CMS 2000 had paging windows, whereby only one could be displayed at a given time.

A key feature of the new system is an "auto learn" capability that archives information.

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In addition, CMS 400 can receive alarms from various devices on the network. In the case of an alarm indicating that a modem is streaming or in a continuous request-to-send condition, the system can reset the modem. When an alarm is more informational in nature, such as a receive level falling below a specified parameter, it will not take corrective action.

Intelligent devices capable of generating event statistics can upload them to the Personal System/2-based net control station, from where they are sent to a printer.

An entry-level version of the product, which manages 32 diagnostic channels and as many as 512 devices, costs $10,000, including the Personal System/2. A 512-channel, eight-operator system is priced at $150,000.

The product will be available on a limited basis in the second quarter of 1990; volume shipments are scheduled to begin in June 1990.

For more information, contact Racal-Milgo at 1601 N. Harrison Pkwy., Sunrise, Fla. 33323, or call (305) 475-1601.

Data base supports 255 nodes

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head. By providing a single answer, Magix offers more complete information more quickly.

Panzarella said the product has its own operating system — Magix Operating System — and supports communications, data base and compiler functions. Combining these capabilities overcomes potential compatibility problems encountered when using disparate products to perform each function.

Magix uses a client/server architecture, meaning the processing load is spread between the server and the workstations.

The Factory product uses a proprietary development language to help build applications. The language, Magix Development Language, asks the developer for English language information, which is then used by the software to automatically build an application.

That simplified approach minimizes development time, one of the company's goals. Panzarella said Magix applications can be written in one-third of the time required to write C applications.

Both varieties of Magix Version 4.0 are available now. Factory costs $20,000; however, for value-added resellers dealing with end users, the price is $12,500. Runtime software costs $1,250 for four workstations and $13,400 for 255 workstations.

For more information, contact Advanced Software Technologies at 2041 Rosecrans Ave., Suite 297, El Segundo, Calif. 90245, or call (213) 322-4440.

Hubbing device ties equipment

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ken rings, for example, cannot communicate with an interface supporting Ethernets.

SmartLink capabilities

For users requiring net management functionality, SmartLink modules in each chassis will report network statistics to LightWatch software running on an attached personal computer.

Information sent by SmartLink includes the number of data packets transmitted and the amount of actual throughput in relation to the link capacity. SmartLink also features the capability to generate sample network loads for determining how increased data traffic affects response time, Green said.

The network management functions of the Crossbow system comply with the Simple Network Management Protocol standard, so it can be integrated with other standards-based net management products, according to the company.

The FX6600 chassis with power supply is priced at $1,725; the CC6613Z module costs $1,875; the CC6615Z is priced at $1,550; and SmartLink costs $2,515.

Fibermux can be reached in writing at 9310 Topanga Canyon Blvd., Chatsworth, Calif. 91311, or by calling (818) 709-6000.

CPU uses infrared net link

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a consistent format before sending it back to the hand-held terminal.

"The TraveLite 286 can use a hospital's existing cable television network to access hospital data bases," Steinberger said. "It gives users access to multiple vendor systems without having to build a new communications infrastructure."

The TraveLite 286 allows users to create custom menus that appear on the unit's 6-by-9-in. touch screen. By pressing a menu field on the touch screen, users can access data from across the corporate network. The TraveLite 286 can also be attached to an optional carrying case/keyboard that turns the unit into a laptop computer. In addition, this laptop can be attached to a desk-sized unit containing three card slots, which can be used to support interfaces to different nets.

Users can buy a complete network package from DFM, including TraveLite 286, TVCU and net server, or these items can be purchased separately. The TraveLite 286 costs $3,970 and will be available in February. The TVCU is priced below $1,000 and will be available in December.

DFM can be reached at 1776 22nd St., West Des Moines, Iowa 50265; (515) 225-3933.

OUTSOURCING

BY JEFFREY KAPLAN

Users give up trying to be their own Bell

Since the AT&T divestiture, communications managers for companies large and small have had to assume greater responsibility for managing their network operations.

This need for self-support can be attributed to a large extent to network vendors' failure to adequately meet the service and support needs of their users. When demand for new products exploded, vendors paid little attention to customer service-related issues. Instead, they were interested in getting boxes out the door and keeping up with the escalating technological capabilities of competing products.

As a result, many users were given little help installing and maintaining their new equipment. They often paid for service contracts to ensure that their networks would be serviced if a problem occurred but nearly as often found that the quality of this service was far below their requirements. Despite the benign neglect, vendors considered service an important revenue stream and a major source of profits.

Users have learned their lessons and now carefully evaluate network vendors' service capabilities before buying products. And vendors have learned that service is now a key distinction in an industry where many product market segments have experienced lower demand and rising price competition. Although operating margins have declined, service still represents a major factor in a vendor's profitability.

With this in mind, vendors have invested heavily in upgrading their service operation. They have trained their field service staff in both technical and account management skills. They have installed state-of-the-art call management systems to route and log customer calls. They have developed remote diagnostics services to monitor and identify problems, and they have redesigned their service programs to make them more flexible to meet each user's unique needs.

Their efforts seem to be paying off. The Ledgeway Group, Inc.'s most recent survey of 365 telecommunications managers found these users are increasingly willing to rely on outside vendors for a wide array of network services.

The reason for this major shift in attitude is users' growing frustation with managing their own networks and greater confidence in vendors' ability to provide satisfactory support. Tired of the problems associated with recruiting and training technical staff, users want to focus their energies on their primary business.

For a growing number of users, "outsourcing" has become the buzzword for turning over an increasing proportion of their data processing operations to outside vendors. The same trend is emerging in the communications arena. Vendors such as AT&T, with its AccuMaster Management Service program, and IBM, with its Network Support program, are poised to take advantage of this changing user need.

However, those of you who are telecommunications managers still need to evaluate vendor support capabilities carefully. Your communications networks have become critical elements in your business operations. You cannot afford to relinquish control over the administration of these facilities without assurances that your network will be operating at maximum capacity. You should build into your service contracts performance standards that your vendors must meet to earn their fees, and you should be given a discount each time the vendor fails to meet those standards.

Users should welcome the opportunity to relinquish day-to-day responsibilities for operating their networks. But they should retain the authority to manage their network operations effectively and ensure that they function at an optimal level to meet users' needs.

Kaplan is director of networks and professional services with The Ledgeway Group, Inc., a market research and consulting firm in Lexington, Mass.

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Framingham, Mass. 01701-9171
(508) 820-2543
MCI Mail — 390-4868
An IDG Communications Publication

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EDITORIAL

User Excellence Award entries reveal cost control trends

"What steps are you taking to contain communications costs?" That question was asked of all the entrants in *Network World*'s 1989 User Excellence Awards competition, and the answers we received were intriguing.

Our entrants do not appear to be moving away from private networking and toward heavy dependence on third-party network service providers. This counters the views of industry pundits who claim to have identified a strong trend toward "selling the mail room," as author Peter Drucker puts it, and farming out service-oriented corporate functions to third-party service providers.

Indeed, the majority of User Excellence Award entrants who claimed significant cost savings said they achieved those savings by gaining more control of their own networks and depending less on carriers and service providers.

Keys to success

Five specific items led the list of favored money-saving tactics:

- Migrating as many applications as possible onto a T-1-based integrated voice/data backbone network that compresses voice and video traffic.
- Implementing local or regional bypass of exchange carriers through use of digital local loop facilities, typically based on microwave technology, to extend T-1 backbones directly to company sites. This enabled companies to deliver more bandwidth at a lower incremental cost and to reduce or even eliminate inter-LATA toll call costs.
- Automating the inventory and billing processes. This step typically involved collecting a broader range of call detail information.
- Encouraging users to depend more on electronic messaging and less on either phone calls or written memos.
- Using virtual network services to serve areas where limited traffic made private net facilities uneconomical. This was done as a cost-saving measure by users who, although they had somewhat increased their use of vendor services, clearly intended to emphasize the private side of their hybrid networks.

> Unfortunately, no company claimed to have identified a single, surefire solution for network cost control.
>
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While the preceding techniques were the most popular, some companies saved large amounts of money through use of less common but highly effective tactics, including:

- Collocation of T-1 equipment in carrier facilities.
- Telephone bill verification, focusing first on data circuits and then expanding to include other types of circuits.
- Joining buyers' consortiums.
- For international networks, developing an architecture that efficiently melds newer technologies used in developed countries with older technologies still prevalent in developing countries.

Many companies are using a combination of the approaches listed above. Unfortunately, no company claimed to have identified a single, surefire solution for network cost control — unless you want to count the two wags whose responses to the question above were "No budget increases" and "We don't pay our phone bill."

While no two companies reported cost-saving strategies that were completely identical, three common threads ran through the majority of them. First, users clearly are saving money by migrating from analog technology to digital technology wherever possible. Second, users are monitoring their expenditures more closely and more often.

Third, while some companies may be looking toward "outsourcing" network services, most appear to have concluded that they'll control costs better by keeping their networks firmly in their own grasp.

OPINIONS

ISDN

BY ANDRES LLANA JR.

It's time to take advantage of services available today

While ISDN services continue to germinate slowly, many users sit and wait patiently for ISDN nirvana. Meanwhile, the leading-edge users are seeking out and implementing ISDN-like capabilities that are available in their service areas. Why haven't more users taken advantage of these ISDN-like services?

Furthermore, why are the local exchange carriers so cautious about deploying available ISDN-like capabilities?

Even if the local exchange carriers were capable of offering ubiquitous ISDN services, many users aren't exactly waiting with bated breath for full ISDN.

This is because ISDN is expensive. To supply it, carriers must replace older central office facilities with newer, more expensive switches, provide upgraded clear-channel transmission facilities and deploy new signaling transfer points. In addition, they must develop new operating and maintenance procedures, which will also affect operating costs.

Such equipment changes will, in turn, negatively impact users, who will have to replace private branch exchange and key facilities with more costly PBXs and terminal adapters to take full advantage of ISDN services. This huge cost burden is simply not necessary for many ISDN-like applications.

Currently, there are two ISDN-like capabilities that can be readily deployed. Several progressive local exchange and interexchange carriers now offer such ISDN-like services or will be doing so shortly.

One service is switched 56K bit/sec. While not a full 64K bit/sec ISDN B channel, switched 56K bit/sec can support most applications without requiring expensive ISDN adapters.

More importantly, switched 56K bit/sec service is much easier and less expensive for carriers to provide and for users to implement than a full 64K bit/sec ISDN B channel service. In addition, central office technology to support switched 56K bit/sec service is readily available and relatively easy to deploy.

Central office technology for switched 56K bit/sec support is available from such vendors as Northern Telecom, Inc. and Integrated Network Corp.

The latter company's switched 56K bit/sec product line — Universal Switched Data Capability — supports a wide array of stored program central office switches, including the 1AESS, 4ESS, 5ESS and DMS 100. This type of equipment enables carriers to upgrade a central office switch economically without expensive software and hardware augmentation.

Of the major carriers, only US Sprint Communications Co. has aggressively deployed and marketed switched 56K bit/sec service.

US Sprint appears to have taken the position that since a 56K bit/sec call does not take up any more bandwidth than a 64K bit/sec voice call, why not price the service at a voice call rate? This makes switched 56K bit/sec a viable alternative for many applications, as well as disaster recovery.

A second ISDN-like capability now available is data-over-voice (DOV) technology. This low-cost approach can support simultaneous voice with up to 19.2K bit/sec of data, using plain old telephone service over an existing local loop. Newer DOV systems are based on digital technology and provide data error rates better than 10^{-8} without special provisioning.

Since most personal computers and other distributed data terminal equipment, such as automated teller machines and point-of-sale terminals, transmit at rates less than 19.2K bit/sec, DOV-based services should be able to meet the needs of many applications at a cost far lower than ISDN.

The DOV units required at each end of a two-wire local loop typically cost between $250 and $350 per unit. These devices support any standard analog telephone for voice applications and will interface directly to the user's data terminal equipment, making these systems ideal for retail stores.

Nynex Corp. companies have taken the lead with DOV technology and have filed tariffs with the Massachusetts and New York public utility commissions for DOVPath.

DOVPath will be a data-over-voice product provisioned through a single central office trunk. For basic 9.6K bit/sec access, the Massachusetts filing calls for a rate of only $15 per month above the normal single central office trunk tariff. The central office trunk will provide normal two-way voice transmission in much the same way that any ordinary trunk supports plain old telephone service into the central office.

In fact, DOVPath can be provisioned as a trunk within the user's main listed-number hunt group. The data portion becomes part of a point-to-point data circuit, which can be routed through the central office just like any other point-to-point data circuit. The user, in effect, can use this point-to-point circuit to establish a simultaneous voice and data connection in much the same manner as an ISDN connection.

The data path runs at 19.2K bit/sec and acts as a digital data service circuit. *Any* central office can be equipped to support such an offering on either a line-by-line or as-needed basis without replacement or major modification of embedded plant.

Certainly, the carriers aren't required to offer every new technology that comes along. But several ISDN-like capabilities seem to be obvious winners for both carriers and users.

Rather than continuing to do nothing until ISDN arrives, wouldn't it make sense for carriers to follow the lead of US Sprint and Nynex and give users what they need at cost-based prices? With offerings such as DOVPath and switched 56K bit/sec available, why would any user want to wait for ISDN?

Llana is director of consulting services for Vermont Studies Group, Inc., a telecommunications consulting firm in West Dover, Vt.

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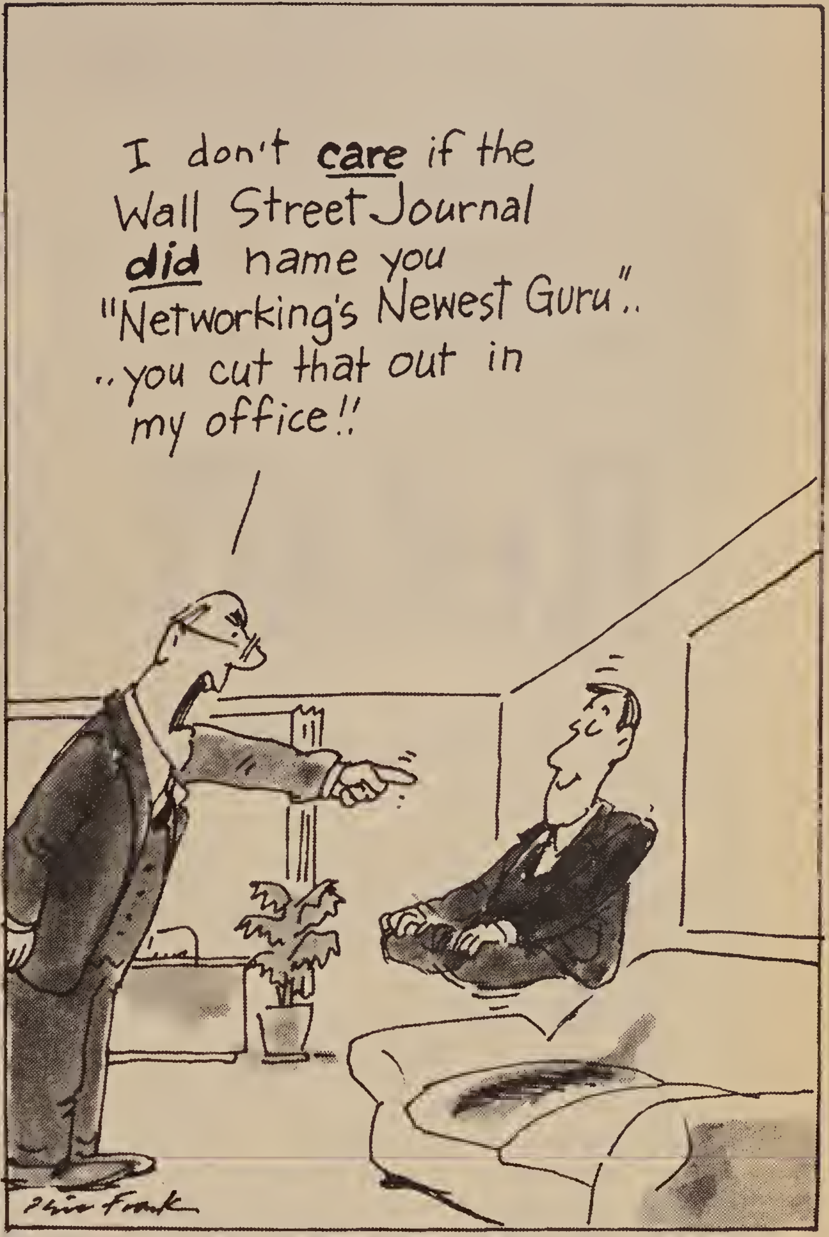
TELETOONS

BY FRANK AND TROISE


I don't care if the Wall Street Journal did name you "Networking's Newest Guru".. ..you cut that out in my office!!

LETTERS

Centralization is key

In his letter ("MIS vs. the end user," *NW,* Oct. 23), Mr. Baqui rightly identifies many of the problems with traditional MIS organizations. I agree that these shortcomings are in many ways responsible for the rise of unmanaged end-user computing. However, I do not concur with Mr. Baqui's assessment that end-user computing "ain't broke."

While AB Automation may be doing quite well with little or no centralized planning, the experience of the largest users of distributed computing (aerospace, high-tech and manufacturing companies) shows something else. Specifically, a slow but steady degradation of data communications services and capabilities as multiple local nets, software applications, bridges and routers are deployed without rhyme or reason.

These companies believe that corporate communications may break down totally amid a glut of incompatible, unmanaged systems unless some centralized order is brought to the chaos of the local net explosion. While smaller companies with little or no research and development activity may not face these same pressures today, I believe the experience of these most sophisticated users is a good lesson for us all.

I agree with Mr. Baqui that creating a traditional MIS organization to support distributed computing is not the answer. This is why I suggested the development of a new, more streamlined and more responsive central organizational model. With some creativity, plus a lot of input from and participation by end users, my hope is that large organizations can benefit from a planned approach to end-user computing, rather than suffer from unmanaged diversity.

Mary Johnston
Principal
Northeast Consulting
Resources, Inc.
Cambridge, Mass.

Loss of American freedom

Referring to Robert Corn-Revere's article on the privacy of cellular phones ("Cellular phones: only the illusion of privacy," *NW,* Aug. 28), I was surprised that a person spe-

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INDUSTRY FOCUS

RETAIL POINT OF SALE

Retail detail

By TOM FRIEDMAN and VAHE KATROS

Networking professionals should have no trouble understanding retailing.

Like networking, the topology of retailing is dispersed with registers linked to stores, stores linked to chains and chains linked to holding companies. And just as networking has a variety of operating systems, retailing has its share of operating formats, from speciality to discount to department stores.

Retailing resembles networking in other ways. Networking involves facilitating and managing data flow, while retailers are concerned with directing the flow of merchandise from the factory to consumers.

A simplified description of retailing looks like this: Sell the right product in the right place for the right price in the right way — and at the lowest cost. These directives take into account changing national and regional economies, tastes and demographic trends. It has become a daily exercise among retailers to know how to pick and reinforce winning merchandise.

Ideal for networking

Although most retailers have a corporate structure ideally suited for networking, the complicated data processing environment in the retail industry has delayed the widespread implementation of networking. Retailers only now are considering how to use data communications to their advantage.

When it comes to technological advancements, retailers are unwilling to invest their time and money if their current equipment minimally meets their needs. It is a cash flow business, and that makes it difficult to invest unless there is a *desperate* need. Retail DP managers live in an environment of applications that span from standard batch programs to point-of-sale store programs. That range exists in few industries.

POS represents a real-time processing, interrupt-driven, nonlinear world. The traditional DP manager has fallen short by applying a linear top-down approach to the POS environment.

(continued on page 33)

Katros is technical editor of "Retail Systems Alert" newsletter and a former systems project leader at Filene's Department Stores. He is currently managing the introduction of local networks at Bentley College in Waltham, Mass. Friedman is editor and publisher of "Retail Systems Alert" and sponsor of Networking for Retailers, a conference to be held Nov. 15 in Dallas.

After a slow start, networks are now becoming an integral part of many retail operations.

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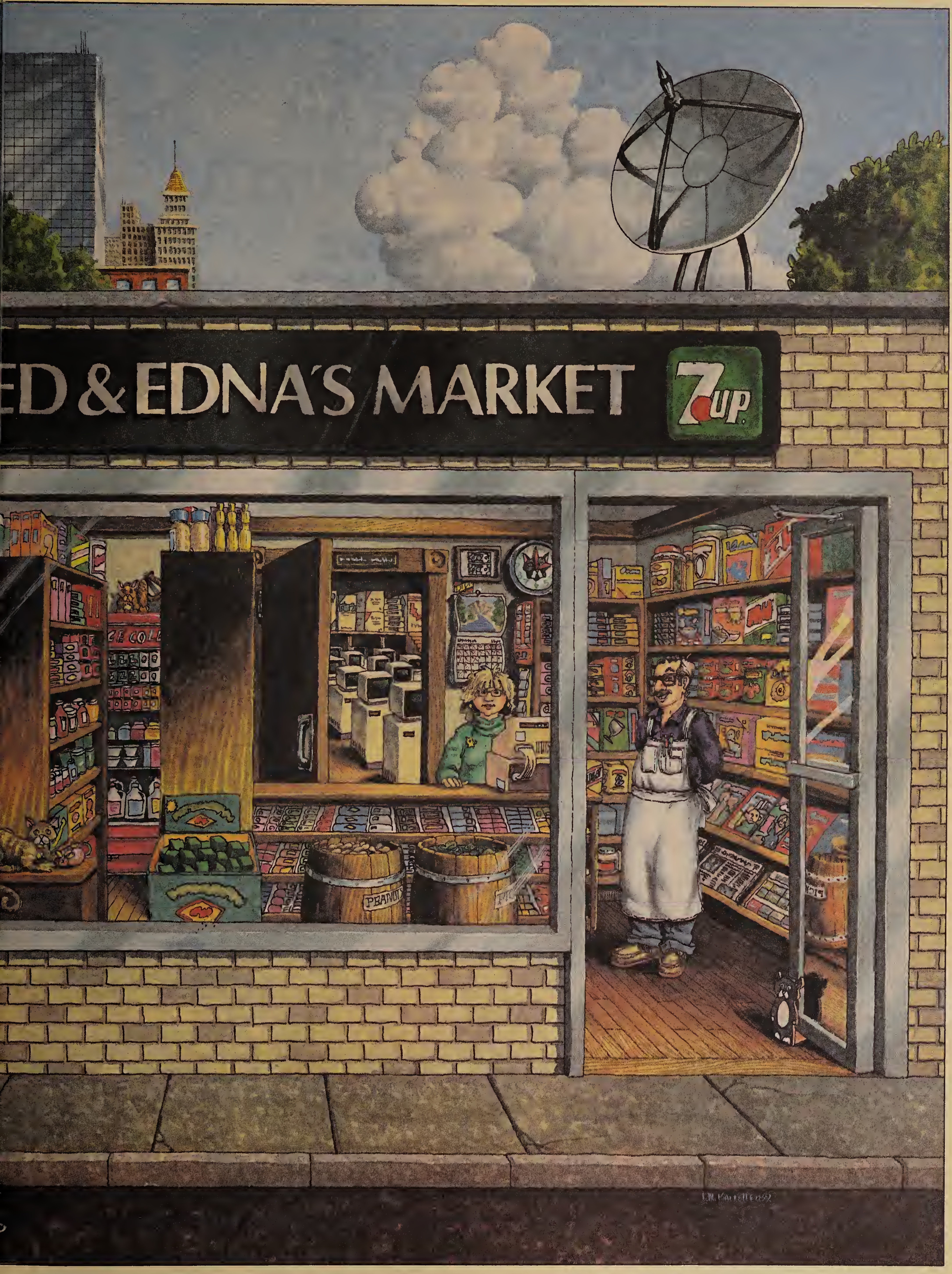
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(continued from page 30)

POS systems serve what is essentially a real-time environment where the end user is the customer or sales clerk. Consequently, most retailers are only now completing the implementation of POS, merchandise management and other core systems.

Because of downloading to price lookup files (PLU) and higher levels of store-based merchandising activities, expected demand on these core systems has caused retailers to focus on data communications and networking technologies. At the same time, many retailers see a need to control desktop computing, plan for electronic data interchange and understand the options available in a deregulated telecommunications environment.

More than 70% of all major retailers are considering investments in network and data communications equipment, according to a recent survey by the "Retail Systems Alert" newsletter and other major end-user surveys by organizations such as Chicago-based Touche Ross & Co. and the National Retail Merchants Association.

Satellite communications, local networks, distributed operating systems and other communications technologies are among the products that retailers will purchase in the near future to achieve their business objectives.

The data pipeline

The new impetus behind networking is the result of the introduction of data collection through scanning at the POS. This has allowed retailers to capture critical sales data on a large scale for the first time.

Most retail systems professionals believe this efficient data-capture infrastructure will overwhelm the data communications systems currently in place. These systems are usually designed around nightly polled leased and dial-up lines.

Regarding uploading, at current speeds of 9.6K baud, a retailer with a large number of stores may only have two chances to recover sales data from a store during an evening because the bandwidth is limited. At present, the communications window of opportunity is at its maximum for many retailers. The risk of losing a store's sales data is unacceptable to senior management, forcing many retailers to invest in new technology.

The downloading side concerns transmitting prices to stores. In a full-line department store, the store's price file can consist of two million records with an average length of 100 bytes.

With the new Voluntary Interindustry Communications Standards (VICS) price file structure, established by major general merchandise and apparel retailers to accommodate bar code scanning, cross-referencing techniques can reduce the size of the price file to 350,000 records. However, few retailers have implemented the VICS structure.

At 9.6K baud, the price transmission for a full-line department store now takes close to two hours. The problem is the production window, especially when the user has a large number of stores and wants to synchronize with planned promotions.

In addition, stores are paid for goods at set price levels, so the POS system must have accurate pricing to accommodate the proper margin.

Newly automated PLU systems will also increase demands on data communications. The newer PLU file specification is a redesign of store-based data bases.

In the past, PLU files were downloaded with price data for selected departments. The new price file specifications are larger and more detailed, including information to kick and close off price promotions automatically.

Department and discount store retailers typically keep 300,000 or more stockkeeping units (SKU) in their stores. As retailers implement PLU files at the store level, store controllers will likely serve as SQL-based file servers, feeding POS terminals that run on local networks. These store controllers are typically minicomputers or supermicrocomputers that run the stores' POS systems.

By frequently transmitting price changes from a central computer, retailers synchronize their data files so that all stores sell the same merchandise at the same price at the same time.

At present, not all applications that control these transmissions are based on client/server

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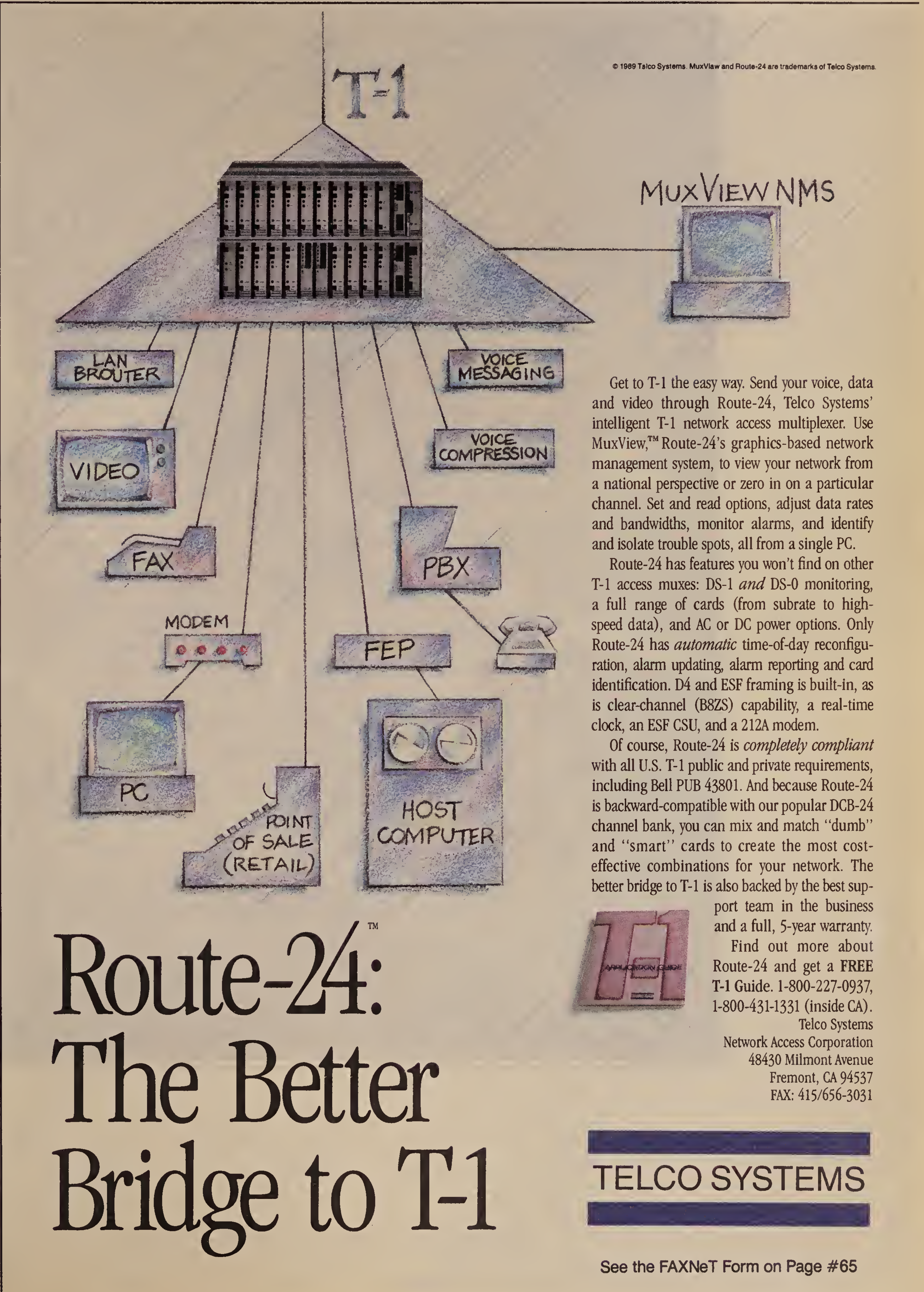

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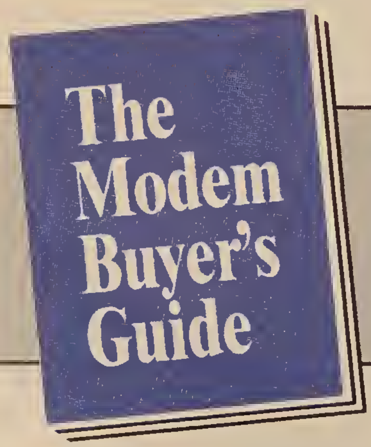

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Leaving the ivory tower

CONTINUED FROM PAGE 1

Consultative Committee on International Telephony and Telegraphy jointly developed the standard.

First finalized as a CCITT recommendation and an ISO standard in the 1988-89 time frame, X.500 is now being rewritten, and a complete set of CCITT recommendations is scheduled for 1992. Meanwhile, the first new ISO Draft International Standard (DIS) is scheduled for June 1990.

The X.500 Directory Service is both a critical part of OSI's infrastructure and the basis for value-added services in its own right. Proper handling of naming and addressing issues is key to the success of OSI in the communications marketplace. With the number of addressable applications eventually numbering in the thousands and the number of X.400 users in the millions, OSI networks must be dynamic and easily configured.

X.500 resolves naming and addressing problems by providing users with worldwide access points to an interconnected directory that can be updated by users in distributed locations.

Prototype products

X.500 has generated considerable interest in the scientific and academic communities. Several universities and other organizations have developed or ported prototype directory products and have carried out interworking experiments with the local directories they have built.

The most widely used X.500-based product is the Quipu Directory System. The word "quipu" refers to a knotted string with colored threads that the Incas of Peru used to store information in lieu of written records. Quipu is part of the freely available ISO Development Environment suite of OSI-related products sponsored by The Wollongong Group, Inc. and Northrop Corp. to accelerate the spread of OSI.

(continued on page 38)

Blum is a member of the Corporation for Open Systems International (COS) technical staff. This article is his contribution and does not necessarily represent the views of COS.

The X.500 Directory Services standard's success in the scientific and academic communities has yet to translate into acceptance by commercial and government users.

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(continued from page 37)

A recent October message to the Quipu distribution list on the Internet electronic mail network highlights its embryonic but vital nature.

The message begins, "I managed to get a [Directory Service Agent] to stay up long enough to search the entire [Directory Information Tree] for DSAs . . . " There follows a list of 60 servers with names such as Brazilian Three-toed Sloth, Spectacled Bear, Vampire Bat and Giant Anteater. The message also pointed out that few organizations have more than one DSA at this time.

However, X.500 has yet to permeate the commercial and government markets. The standard has not been incorporated in the U.S. Government OSI Profile (GOSIP), which would eventually make it a requirement for some contracts. Although use of X.500 is recommended in both the 1984 and 1988 versions of the X.400 electronic messaging standard, most existing, fielded MHSs use proprietary directories, not X.500.

Many major computer vendors have Manufacturing Automation Protocol directories based on a restrictive subset of a prestandard version of X.500 that was available in 1987.

But few have extended these implementations to align with the full 1988 X.500. Most vendors and telecommunications service providers have personnel studying or prototyping X.500; others have proprietary directory systems that may display some degree of X.500 compatibility or conformance. However, a fully conformed X.500 product has yet to be exhibited at any of the major computer industry trade fairs.

A fully conformed X.500 product has yet to be exhibited at any of the major computer industry trade fairs.

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Access control

The major factor holding up X.500 seems to be access control, or the ability to restrict the availability to particular users of various directory operations — such as Read, Search and Add Entry — and the objects or attributes against which those operations might be applied.

Few prospective users of X.500 are willing to leave information completely unprotected; nevertheless, there was insufficient time during the standards-setting process to include either a general access control framework or operations for the remote management of access control information. All this has been left to the discretion of individual implementors.

Nonstandard access control has two drawbacks. For one, a large user whose X.500 directory spans multiple hardware and software platforms must attempt to reconcile orthogonal views of access control into some overall security policy; consequently, they incur additional operations and training costs. For another, diverging views of access control can lead to interworking problems between X.500 implementations.

Few prospective users of X.500 are willing to leave information completely unprotected.

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A review of some proceedings at the June meeting of the Directory Special Interest Group (DIR/SIG) within the National Institute of Standards' (NIST) OSI Implementors Workshop (OIW) vividly underscored the dilemma access control presents to the X.500 community.

The DIR/SIG, along with others in the OIW, functions as a forum for implementors and users to develop profiles of the base standard. These profiles, called Implementor's Agreements, may classify features of OSI protocols as mandatory or optional. They may preclude the use of certain operations or clarify vagaries in the CCITT/ISO standards. They do not normally attempt to extend or modify the standard.

Prestandard agreements

At the June meeting, however, NIST personnel developing the GOSIP profiles urged the DIR/SIG to develop prestandard agreements on access control. Representatives from the Defense Message System project — which intends to eventually replace the Internet network with an X.400/X.500 mail system — and a Department of Energy/National Aeronautics and Space Administration project indicated that they had major directory procurements pending but were unhappy deploy-

In their recent *Audience Survey of Communication Networks '89*, Exhibit Surveys asked the following open-ended question:

Q "What publications do you read regularly (at least 3 out of 4 issues) to keep up to date in your field?"

ing an X.500 system with nonstandard access control.

For DIR/SIG members representing X.500 vendors, prestandard agreements are anathema. Most directory implementations already possess a proprietary version of access control.

Since ISO has a work item to produce a directory access control DIS by June 1990, the implementors are already resigned to eventually replacing or modifying their proprietary access control. Prestandard NIST agreements would represent yet another costly project.

"It's the users vs. the vendors," complained a U.S. government representative, reflecting the desperation of many attendees who believe something must be done about access control immediately. The issue was batted back and forth in the meeting for some time before being settled with a hallway compromise; the DIR/SIG would resolve to adopt the earliest available ISO DIS, regardless of its stability.

Users may be relieved to know that at least part of the access control problem is likely to be solved on schedule by ISO's Directory Working Group. Bull HN Information Systems, Inc.'s Hoyt Kesterson, consulting staff engineer for global systems engineering and chairman of the ISO Directory Working Group, told NIST's DIR/SIG, "I consider an X.500 access control framework to be a top priority item, although remote management of access control operations is less important than some other items."

Problems with X.500 security, in general, continued to surface at the DIR/SIG meeting. Access control itself is only useful if a standardized method exists for authenticating the identity of X.500 users. The standard contains provisions for both simple and strong authentication; the provisions for strong authentication specify the use of public key encryption algorithms.

Groups such as the DIR/SIG must agree on which algorithms will actually be used. Outside the U.S., the industry is gravitating toward the Rivest, Shamir and Adleman (RSA) algorithm. Domestically, however, RSA must be licensed through RSA Data Security, Inc., a private firm in Redwood City, Calif., that is just beginning to establish its terms for pricing and infrastructure.

Identity crisis

Beyond security, X.500 also suffers from an identity crisis that creates mixed expectations at both the specification and the procurement stages of product development. The identity crisis is best expressed by posing the question: Is X.500 supposed to be a very flexible standard for multivendor communications directories, or is it supposed to be a general-purpose data base?

The standard itself is quite clear about X.500's mission and its limitations; in fact, there is a separate standard in the works for OSI Remote Data Base Management. Users, however, often desire to map existing data base applications onto X.500, or worse, confuse X.500 with a general-purpose data base.

While X.500 does not dictate the physical format of the underlying data bases used by its DSAs, it is still based on a hierarchical schema, or logical format. Many users have directories or data bases structured on other schemata, usually of the relational or network variety. Harnessing a DSA to a relational back-end data base can be cumbersome because it is necessary to simulate hierarchical relationships using tabular data structures.

Network data base users may be more or less fortunate. While the network structure is a superset of the hierarchical schema and, therefore, would theoretically support X.500's schema, existing network data base applications might require translation and downsizing.

In addition, users who have invested heavily in data bases that cannot be made X.500-compatible without considerable expense may resist adopting X.500 in their installations.

Access control itself is only useful if a standardized method exists for authenticating the identity of X.500 users.

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Another distributed data base concern is data integrity. X.500 does not support two-phase commit, transaction rollback or other techniques commonly used in a distributed processing environment to ensure absolute consistency.

The directory standard explicitly declares that transient inconsistencies may exist at times in the directory. For example, if a directory entry has been deleted, but for some time, an alias — an object that can redirect an operation from one part of the DIT to another by pointing to another object — still references the deleted information, various kinds of errors can result. These types of inconsistencies may be unacceptable to some applications.

Mismatched requirements

Bull's Kesterson cites perhaps the extreme example of requirements mismatch; a user who wants to store all of an enterprise's information, including payroll, in X.500. Not surprisingly, questions of this nature arise so often that Kesterson has developed a stock answer: "You can have a single data base. X.500 would then be one

(continued on page 42)

A Though more than 100 different publications were mentioned, only one publication won!

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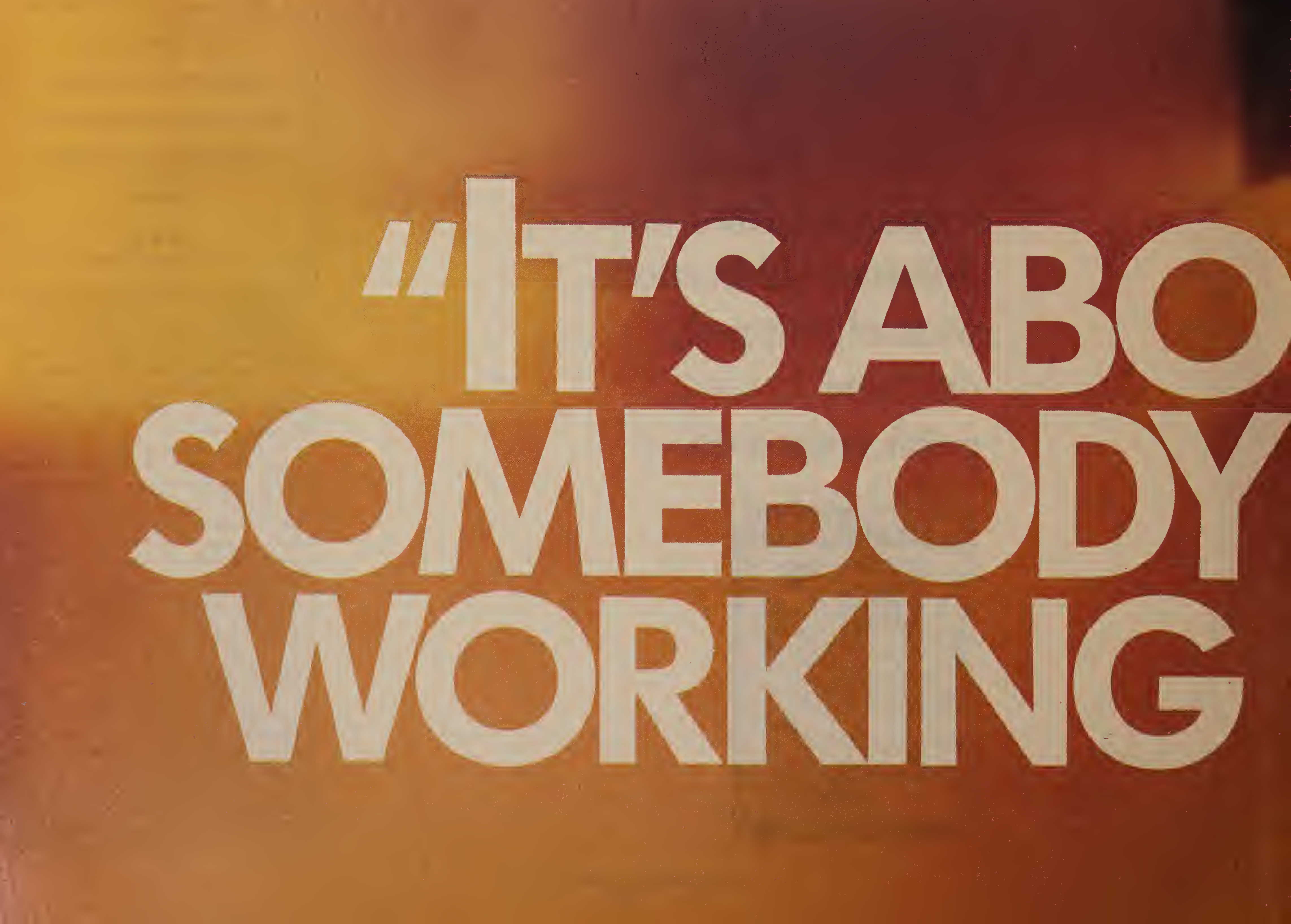

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See the FAXNeT Form on Page #65

(continued from page 39)

view of that data base, payroll another."

And because, given a sufficiently generous software development budget, it is theoretically possible to hook up almost any data base to an X.500 DSA, standards people are prone to wave aside the process of achieving diverse views of the same data as an "implementation detail."

Unfortunately, there are all too few gurus waiting in the wings, especially at user companies, to produce implementation details like rabbits from a magic hat.

Early in the history of telephony, the phone company renamed its "Directory Information Service" to a "Directory Assistance Service." It seems they were receiving requests not only for phone numbers and addresses, but also for shop opening hours, prices and other information. While technology and international standards have made large strides in recent years, the old Directory Assistance adage applies. There will always be some limits to the information that can be stored and to the views one may take of that information.

All the diverse requirements, manifesting themselves at both the specification and procurement stages of product and standards development, create a centrifugal tendency in CCITT/ISO's ongoing X.500 standardization work. In May, the CCITT Study Group VII directory meeting in Oslo, Norway, was attended by 45 participants and received 66 suggestions for changes to the standard. Demands for new functionality are everywhere. Where does the scope of the standard stop?

> There are all too few gurus waiting in the wings, especially at user companies, to produce implementation details like rabbits from a magic hat.
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Planned enhancements

Some of the planned enhancements that are definitely within reach as a result of the Oslo meeting are: access control, short name forms, enhanced search, enhanced information models, replication and, interestingly, a call for contributions on consistency requirements. Of these, access control was discussed above and is important for obvious reasons.

The short name forms and enhanced search and information models are attempts to make the directory more flexible and functional — but to remain a directory, not become a general-purpose data base. The call for contributions on consistency requirements is an effort to improve the data integrity of the directory even as its structure, formed to support the above enhancements, grows more complex.

Replication addresses the performance issue in distributed data bases. Clearly, if an inquiry must pass through several DSAs prior to resolution, it is subject to network and processing delays. Thus, DSA or Directory User Agent implementations will tend to cache frequently referenced entries that are held within the domain of foreign DSAs.

But if the master copy of the cached entry is updated for some period of time, the cache will be invalid. Replication, or shadowing, solves this problem by providing mechanisms for a DSA to keep local copies of information held by other DSAs and to be automatically apprised of updates to that information.

It will be several years before the post-1988 work stabilizes, allowing X.500 to move out of its current mid-life crisis. The industry will keep its primary focus on the 1988 X.500 standards at hand.

> There will always be limits to the information that can be stored and to the views one may take of that.
>
> ▲▲▲

Because of certain limitations in the existing X.500, which make it difficult to set up and maintain distributed DSAs, the fully distributed directory will be slow to arrive. The earliest large-scale public X.500 directories are likely to be provided through gateways to existing centralized services maintained by national bodies — such as France's Minitel Directory, which is still non-X.500 — or large telecommunications providers.

As the available information pool reaches critical mass, demands for access will increase, islands of connectivity will become interlinked, and vendors will come under pressure to provide fuller X.500 support in their products. At that time, X.500 will become a vital part of the OSI infrastructure and fulfill the dream of a global directory of people, organizations and all manner of resources. ◼

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Retail detail

continued from page 33

methodology. However, several value-added resellers have started to pilot program-to-program price file update systems.

The additional data transmission burden has driven retailers to reinvestigate their communications infrastructure. This investigation has yielded solutions based on X.25 packet networks consisting of regional hubs connected by either terrestrial T-1 lines or satellite links.

Some retailers are implementing dual gateways based on X.25 networks so they can bypass inoperative sections of their networks. In the future, ISDN management network offerings will enable retailers to avoid building private packet networks. The bandwidth burden is exacerbated by the requirements to collect all store data.

Customer service

Another factor driving the reinvestigation of retail networking is improved customer service. Customer service has become important in the age of time-starved customers, who are intolerant of waiting and are showing less loyalty each year to retailers with a hostile environment at the POS. A major source of hostility occurs when credit authorization systems fail and sales clerks turn to manual authorization, which can cause a devastating loss of sales.

Large retailers have begun to improve network management systems to prevent this scenario. They are using either recent Integrated Services Digital Network offerings or store-level gateways to Visa International, Inc., American Express Co. or other credit card companies. More retailers will follow the lead of the large retailers as they find short response time producing a competitive advantage.

For example, K mart Corp.'s Builders Square chain, a 140-unit home center retailer based in San Antonio, Texas, has decided to implement Shared Financial Systems, Inc.'s StoreNet/2.

This highly versatile COBOL-based communications package facilitates credit authorization, electronic draft transfer and check verification. Preliminary estimates indicate that Builders Square will reduce credit authorization and settlement costs by 25% because it will no longer go through a third-party settlement group.

Builders Square considers the gateway facility a critical part of its expansion strategy. The strategy calls for a nationwide interactive distributed net that will facilitate an anticipated growth of 10% by 1993.

Shared Financial Systems designed the software to poll a variety of store-based controllers from IBM, NCR Corp. and other POS vendors. In addition, the system supports a gateway to credit card authorization systems.

Builders Square runs StoreNet/2 on the IBM System/88, an expandable, fault-tolerant transactional processor manufactured by Marlborough, Mass.-based Stratus Computer, Inc. By running StoreNet/2 on the System/88, Builders Square puts communications processing into a single unit.

The integrated system also serves as a gateway for trickle transmission and batch polling. It is capable of providing asynchronous, Binary Synchronous Communications, Systems Network Architecture and X.25 support.

The system has operating software for data distribution to third parties, such as American Express and Visa. Because it handles protocol conversion, it relieves the retailer of this task.

Today's environment

Islands of automation have characterized stores. These islands consist of disparate physical and data-link layer protocols. A typical store environment could include an RS-422-based time and attendance system, an RS-232-based energy management system, an SNA corporate electronic mail system, an SNA line for credit authorization and sales data transmission, an RS-232 line for remote control of the store's Token-Ring Wire Center and a line to a third-party banking network.

As protocols at the store level have increased, some vendors have started to develop store-level communications controllers. For example, Cincinnati-based Kroger Co. is piloting Winning Connection, new communications software from GTE Retail Information Services, as part of an SNA leased-line network in 11 stores.

Initially, the software will serve the data communications needs of order entry, POS, pharmacy, direct store delivery, time and attendance, and E-mail applications. The Unix-based communications software is designed to provide unattended management of a multiprotocol communications environment. It provides users with a hardware-independent gateway system between a store and a corporate mainframe.

The software runs on platforms that support Unix, including the IBM RT Personal Computer, Personal System/2, NCR Tower Series 200-800, Digital Equipment Corp. MicroVAX and Unisys Corp. 1100. The software is written in the C language and uses Unify Corp.'s Unify relational data base management system for file maintenance and ad hoc queries. The software handles multiple protocols, including 2780, 3270, 3780 and asynchronous.

Marketing initiatives

Accurate scanned data on item sales has enabled retailers to engage in niche marketing, or micromarketing. Micromarketing has allowed retailers to keep pace with consumer trends at a regional and local level.

To address micromarketing, retailers are investigating ways to understand which items sell to particular consumer groups. Consequently, this effort has created a new store-level customer information data base. To serve this new data base requirement, retailers are investigating

(continued on page 44)

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See the FAXNeT Form on Page #65

(continued from page 43)

dedicated data base machines.

For example, K mart has incorporated Teradata Corp.'s DBC/1012 Data Base Computer into its new store tracking and reporting (STAR) system. This new system handles sales analysis and decision support applications, and it is channel-attached to the IBM processors running MVS-based financial and merchandising systems.

K mart has used Focus and Intellect, two fourth-generation end-user languages, to develop decision support applications for buyers, general merchandising managers, advertising executives and store managers.

While the Teradata computer performs the functions, two mainframes — an IBM 3090/400 and IBM 3090/600 — poll stores through a satellite network. The network uses equipment from GTE Spacenet Corp. to collect scanned data from more than 750 of K mart's 2,100 stores. New scanners allow K mart to collect merchandise data on size, color and style.

Info management woes

Because their stores are dispersed, retailers face a massive internal information management dilemma. In the past, retailers have communicated to store managers, vendors and customers through paper documents and telephones. Now retailers are struggling with E-mail, videoconferencing and image processing systems to handle their future communications requirements.

For example, Bloomingdale's, Inc. of New York and T.J. Maxx of Framingham, Mass., have installed the customer assistance tracking system (CATS) from LSW, Inc., a software development company in Landover, Md. The system enables retailers to capture, respond to and track customer correspondence and telephone inquiries.

Because CATS allows entry of a subject by type and origin, it creates a highly detailed data base of customer concerns. From this data base, the system creates reports based on incident type and allows for ad hoc queries. The system also monitors and analyzes the length of problem resolution and staff productivity.

LSW is developing new modules of CATS for Sears, Roebuck & Co. of Chicago. The new modules will allow Sears' system to receive scanned correspondence.

The modules will then classify the correspondence and convert it into X.400 E-mail packet format for integration into the Sears E-mail system. The E-mail system reads the packet header and sends the correspondence for resolution to the appropriate Sears executive.

Local nets in retail

Retailers have not adopted local networks quickly. Conversely, brokerage, insurance and banking companies have invested heavily in local nets.

Unlike retailers, these companies can economically justify computing on the desktop because they have had access to the raw data needed to run their businesses. Without accurate bar code data, retailers have lacked that access to raw data.

Although the retail process creates a tremendous amount of data, very few retailers have taken the initiative to organize personal computers into a managed resource.

Retailing has a very centralized viewpoint of DP. Until recently, personal computers, which have sprung up in ad hoc fashion, were considered a nuisance rather than a tool. Retailers now find that the personal computer population has reached a critical mass and that local networks have become necessary to control the investments in personal computers.

The retail industry is five years behind other industries in the personal computer revolution. That, however, represents major progress because retailers do not encourage decentralized decision making. In many cases, store-level and chain-level employees are implementers of policy created by senior management.

Consequently, soft benefits such as improved personal productivity have not been enough to cause personal computers to proliferate in retail.

Some uses for local networks are becoming more common. For example, Dominick's Finer Foods of Northlake, Ill., a major Midwestern supermarket chain and recognized local net pioneer in the retail industry, installed local networks in its advertising and public relations departments in 1985. Since then, the company has implemented local nets in other administrative departments that have users who share files.

Dominick's is currently reviewing the possibility of connecting its 21 local networks.

Some of the most innovative local network applications exist among new start-up companies, which view the personal computer platform as an inexpensive way to build a DP function. As their operations grow, these entrepreneurial firms build their data center around a local network architecture.

One such example is Babbage's of Dallas, a national software retailer that has installed its core personal computer network throughout its 129-unit chain and has positioned itself to begin the rollout of departmental servers.

The network's flexibility will allow Babbage's to expand rapidly throughout the U.S. The network includes a corporate 45-node Novell, Inc. network, IBM Personal Computer ATs and 80386-based machines, and a personal computer-based POS system. According to Babbage's, this personal computer network provides the DP horsepower of a mainframe but with more flexibility.

Like other major computer retailers, Babbage's opted to develop its own system because of its familiarity with and confidence in new personal computer technology.

The network manages an inventory of more than 5,000 SKUs per store. It provides an E-mail message system (Babbage-Mail or B-Mail), customized by Babbage's MIS department, between corporate headquarters and each store and gives management access to all inventory and sales information.

Other retailers are expected to follow these networking pioneers in the coming years. ◘

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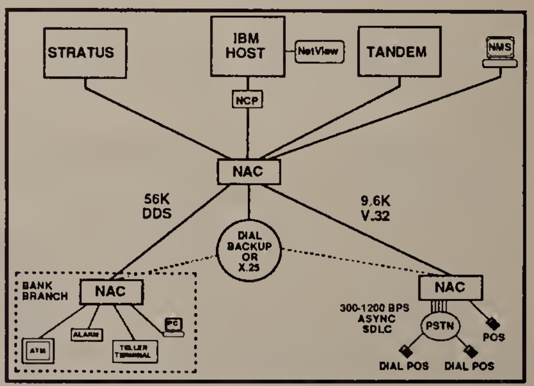

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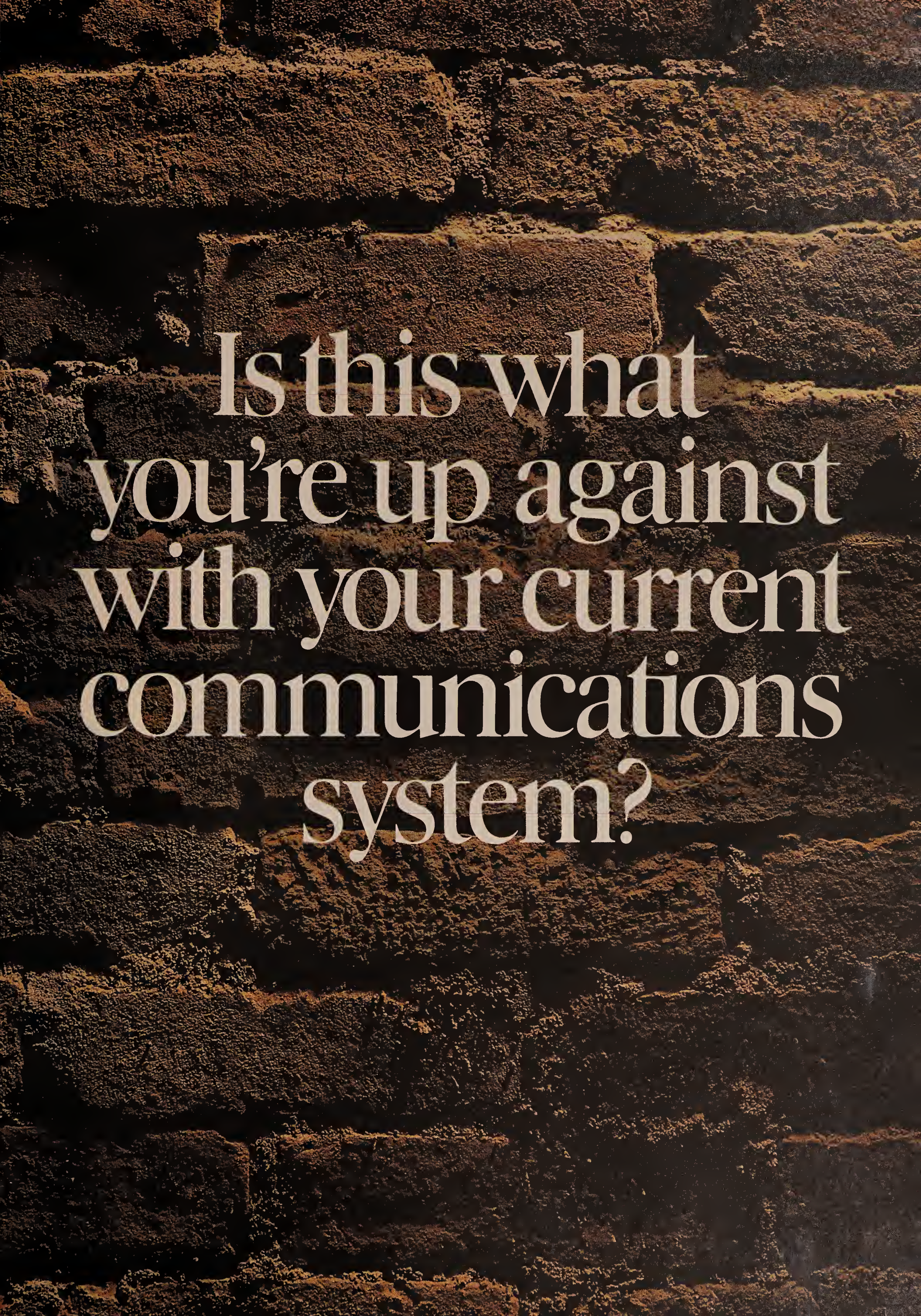
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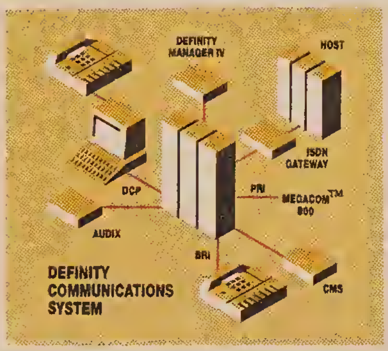

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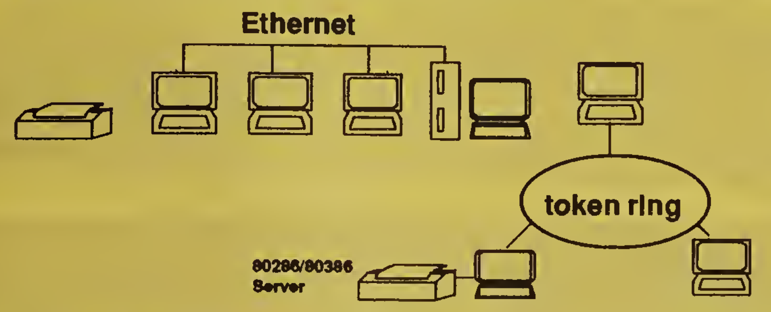

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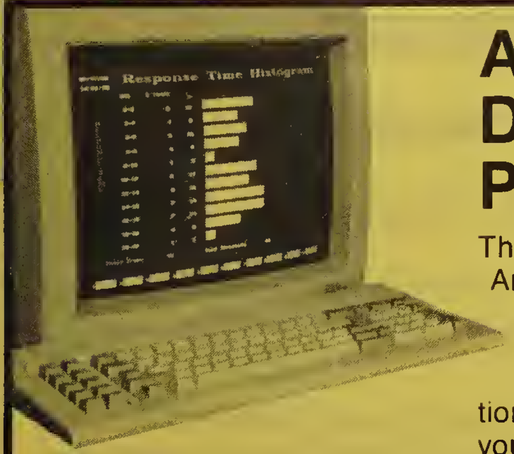

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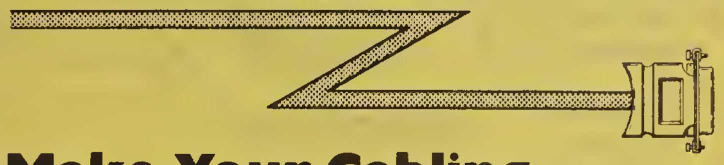

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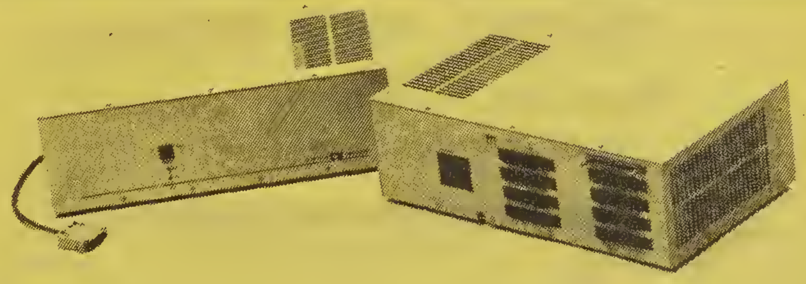

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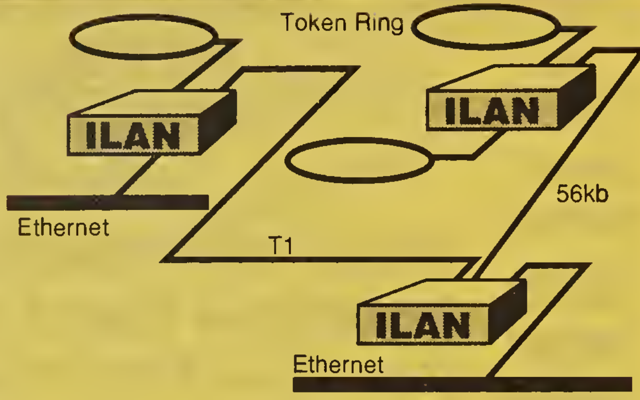

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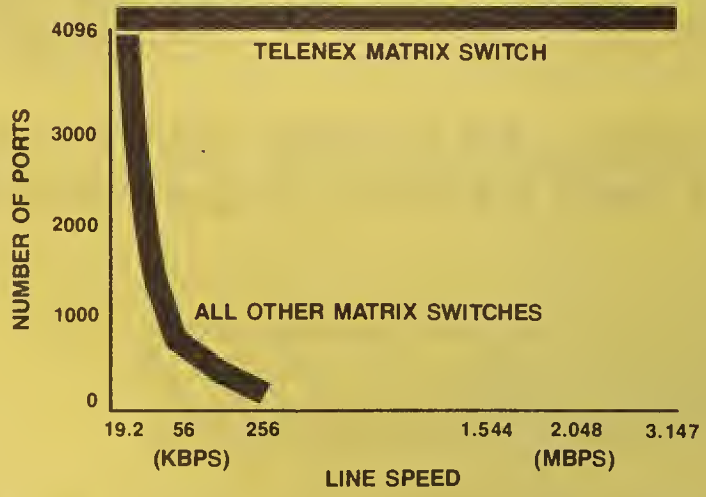

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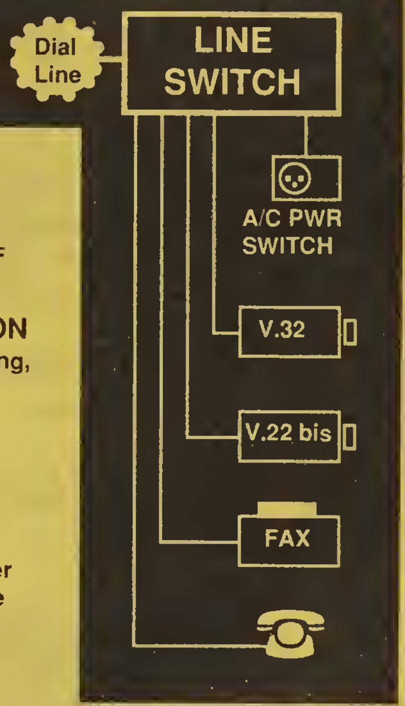

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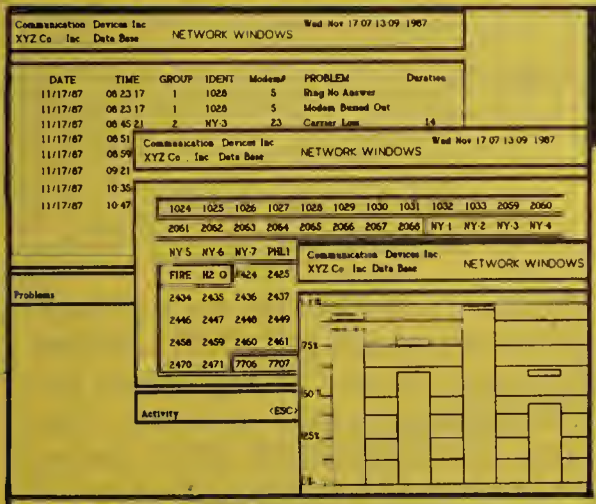

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Communication Devices Inc                     Wed Nov 17 07 13:09 1987
XYZ Co   Inc   Data Base      NETWORK WINDOWS

   DATE      TIME    GROUP  IDENT  Modem#  PROBLEM            Duration
 11/17/87  08 23 17    1    1028     5     Ring No Answer
 11/17/87  08 23 17    1    1028     5     Modem Bused Out
 11/17/87  08 45 21    2    NY-3    23     Carrier Loss          14
 11/17/87  08 51
 11/17/87  08 59
 11/17/87  09 21
 11/17/87  10 35
 11/17/87  10 47

Problems

Communication Devices Inc                     Wed Nov 17 07 13:09 1987
XYZ Co . Inc  Data Base       NETWORK WINDOWS

 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 2059 2060
 2061 2062 2063 2064 2065 2066 2067 2068 NY-1 NY-2 NY-3 NY-4
 NY-5 NY-6 NY-7 PHL1
 FIRE H2 O 2424 2425
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Activity                         <ESC>

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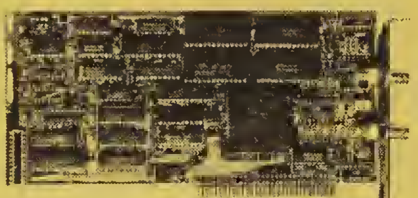

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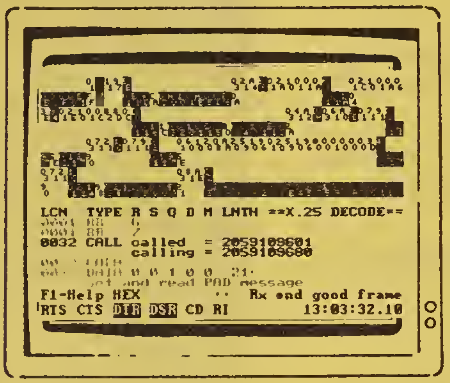
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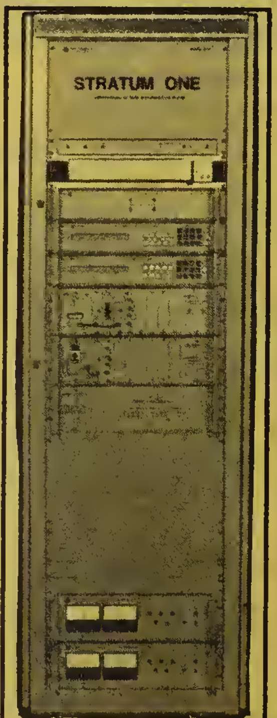

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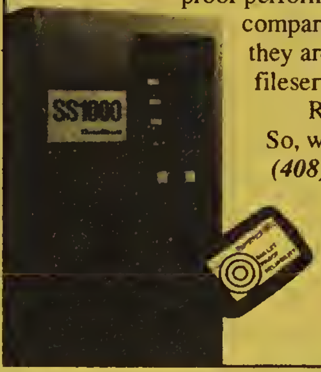

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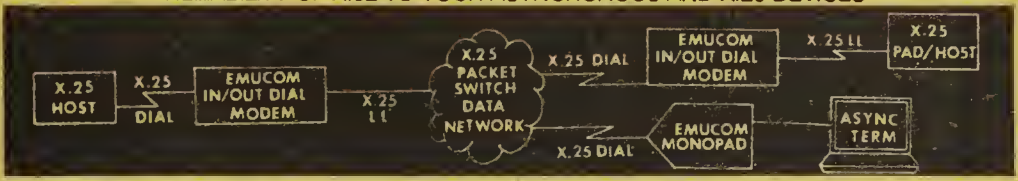

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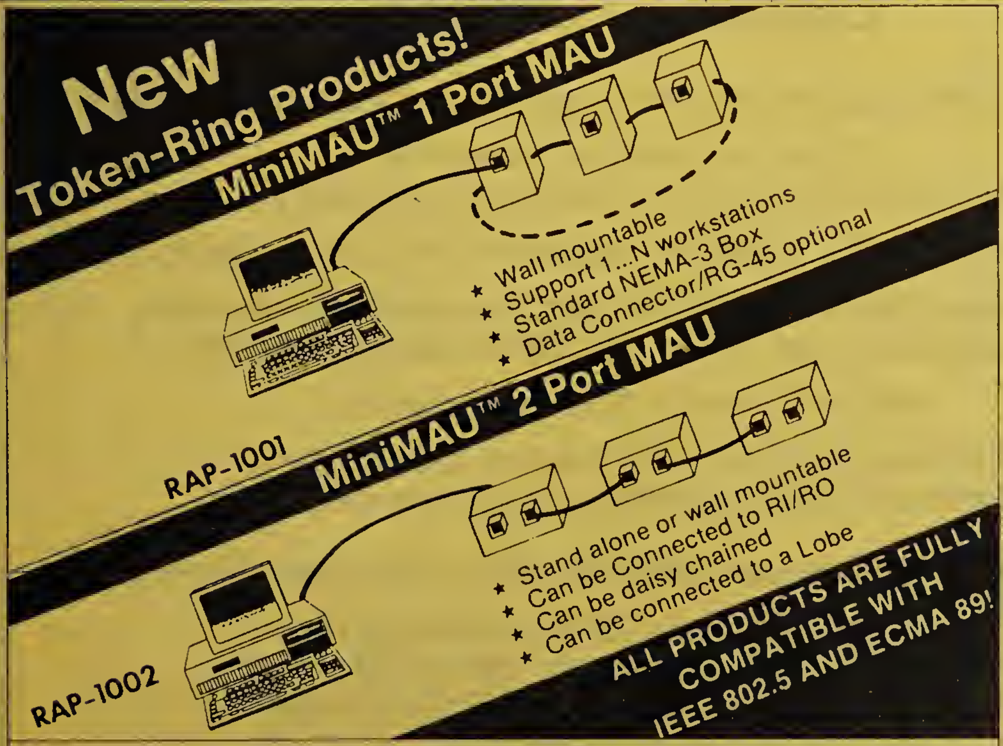

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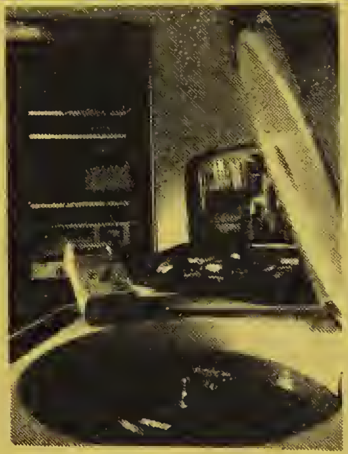

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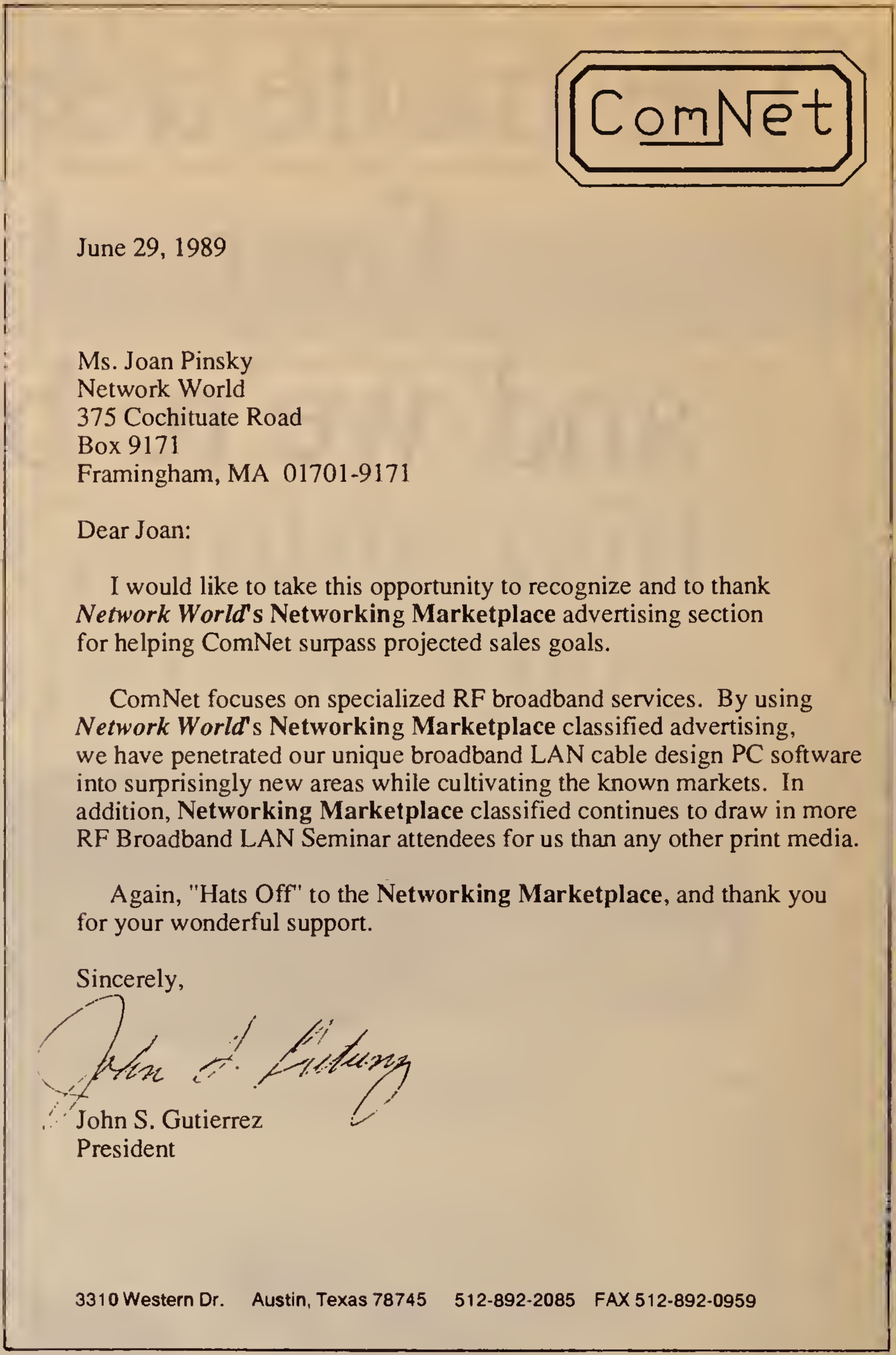

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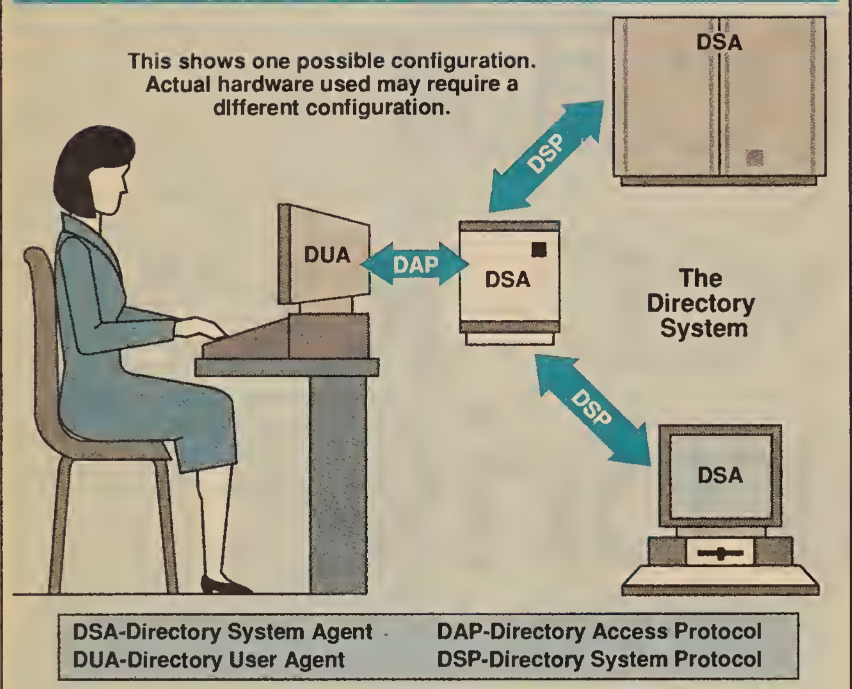
Details of X.500 architecture

X.500 specifies a client/server-style access model and a hierarchical Information Framework model to provide distributed resolution of a set of standard directory inquiry and update operations. These operations form the basis of a heterogeneous directory service available to users of many proprietary systems.

X.500 distributed DUA/DSA interaction
Figure 1



This shows one possible configuration. Actual hardware used may require a different configuration.

DSA-Directory System Agent
DUA-Directory User Agent
DAP-Directory Access Protocol
DSP-Directory System Protocol

GRAPHIC BY SUSAN SLATER

SOURCE: DANIEL BLUM, TAKOMA PARK, MD.

Figure 1 on this page illustrates the basic directory access model. A user accesses the X.500 directory through a Directory User Agent (DUA), which can be a stand-alone directory assistance program or part of another piece of software.

Regarding security, X.500 provides no standardized mechanism of access control to operations on objects in the directory.

▲▲▲

The DUA's behavior and user interface — if any — are not standardized, but the Directory Access Protocol (DAP) that it uses is part of X.500. In any case, the DUA resolves a user's request by passing it to a Directory System Agent (DSA). The DSA will resolve the request or contact one of its counterparts for assistance. Two kinds of DSAs exist — centralized and distributed. The centralized DSA satisfies DUA requests from a local data base. It uses only DAP and does not contact other DSAs.

The distributed DSA, using the Directory System Protocol (DSP), may additionally "chain" the DUA's request to another DSA, or "multicast" it to several remote DSAs. Figure 1 captures the essence of DUA/DSA interaction and distributed resolution of requests by DSAs.

The root of things

Underpinning X.500 is an Information Framework model. In this model, the X.500, or global directory, is organized in a Directory Information Tree (DIT).

At the top of the DIT resides a purely conceptual "root," which exists solely for modeling purposes. Immediately beneath the root lie other objects, most commonly branch objects such as "countries." Beneath countries are "organization" or "locality" entries, and so on down to the common name entries at the leaf, or bottom, level.

Individual DSAs are responsible for portions of the DIT; Figure 2 displays a sample DIT divided among several DSAs. X.500 specifies procedures for distributed operation that are based on a model of how DSAs maintain knowledge of their remote counterparts. Unfortunately, this knowledge must be set up administratively; there is no protocol defined to impart DIT topology information to a DSA when it is first configured or to an existing DSA when the topology changes.

Every entry in the DIT is an object. Objects are made up of attributes, and each must have a unique, or "distinguished name." X.500 specifies a notational system for defining object classes and attributes and uses the notation to define a number of standard data types. Implementers may use this notation to define new object classes for specialized purposes.

X.500 supports both inquiry and update operations, and all operations are carried over Open Systems Interconnection's application-layer Remote Operations Service Element. The inquiry operations are READ, COMPARE, LIST and SEARCH. The READ and COMPARE operations retrieve or check the attributes of a single object; the LIST and SEARCH operations access collections of objects within subtrees of the DIT.

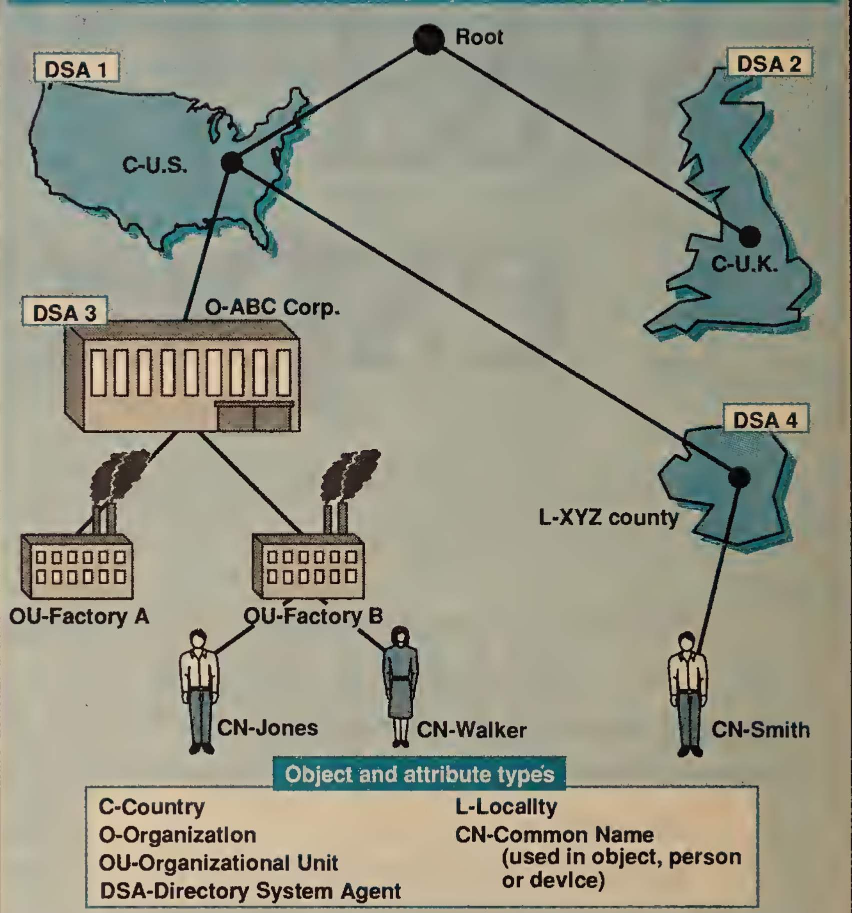
The update operations are Add Object, Remove Object, Modify Object and Modify Relative Distinguished Name. The Add Object and Remove Object operations can be used only against leaf entries or objects that have no subordinates in the DIT. This limitation implies that all hierarchical links between objects held in separate DSAs must be created or deleted administratively.

In addition, there are a few miscellaneous operations: ABANDON, BIND and UNBIND. ABANDON cancels an ongoing operation. BIND and UNBIND set up associations, or connections, using OSI's application-layer Association Control Service Element. During the BIND operation, authentication checks of the requestor's identity can be carried out for security purposes.

Regarding security, X.500 provides no standardized mechanism of access control to operations on objects in the directory; this is widely regarded as the standard's most serious deficiency. However, to support local or implementation-specific efforts at access control, X.500 provides a framework for authenticating a user's identity. Two modes of authentication are specified: simple and strong.

Simple authentication is nothing more than password verification; strong authentication involves the use of public key cryptography techniques. Such techniques are also used to guarantee data integrity and nonrepudiation; portions of DSA requests and responses can optionally contain digital signatures.

Example of a distributed X.500 Directory Information Tree
Figure 2



Object and attribute types

C-Country
O-Organization
OU-Organizational Unit
DSA-Directory System Agent
L-Locality
CN-Common Name (used in object, person or device)

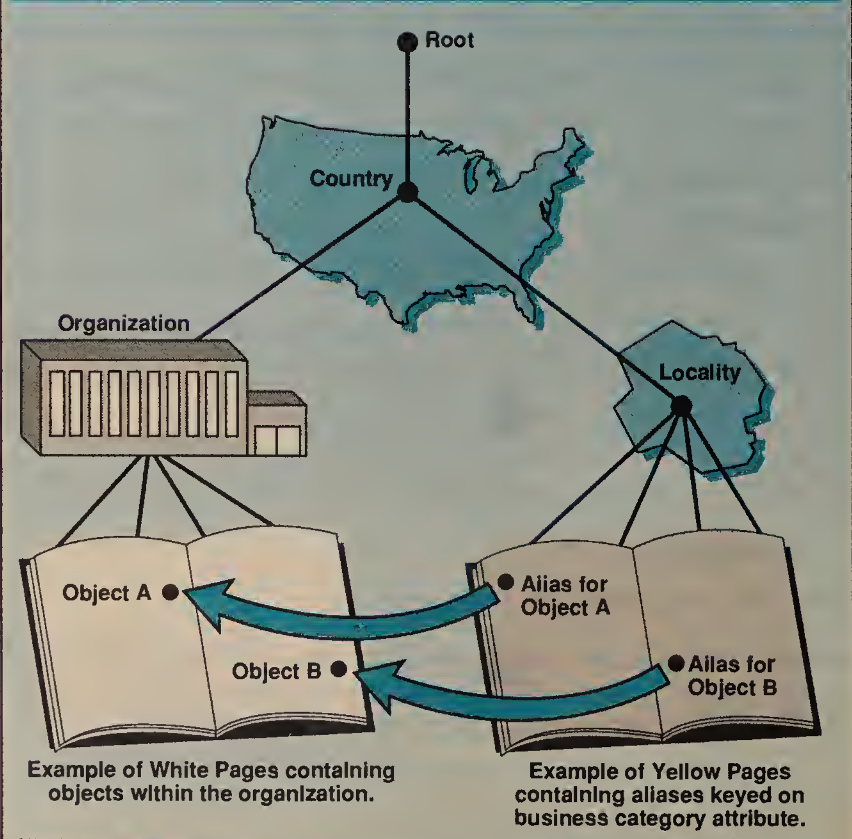
GRAPHIC BY SUSAN SLATER

SOURCE: DANIEL BLUM, TAKOMA PARK, MD.

The directory is designed to support both "white" and "yellow" page modes of operation. X.500 White Pages provide electronic name-to-address mapping; X.500 Yellow Pages provide the electronic equivalent of the familiar phone book, allowing a user to identify company names and addresses for particular types of business.

A Yellow Pages service can be set up in a straightforward manner using trees of objects, each containing a business category attribute. A more sophisticated technique, which avoids possible duplication of data and offers more possibility of search optimization, is shown in Figure 3.

Use of alias pointer entries in optimized X.500 Yellow Pages service
Figure 3



Example of White Pages containing objects within the organization.

Example of Yellow Pages containing aliases keyed on business category attribute.

GRAPHIC BY SUSAN SLATER

SOURCE: DANIEL BLUM, TAKOMA PARK, MD.

This technique is worth studying as another illustration of the flexibility the overall X.500 Information Framework model offers. It involves setting up Yellow Pages as separate trees with branches representing various business categories. Each branch would be populated with collections of aliases, which are objects that can redirect an operation from one part of the DIT to another by pointing to another object.

The aliases direct the inquirer into a White Pages subtree where the data actually resides, thus avoiding duplication. The search is optimized because the DSA only has to scan those companies containing a business category attribute, thereby avoiding all others.

— *Daniel Blum*

Letters

continued from page 29

cializing in communications law would not present these additional facts in an article on this subject.

- There is already substantial protection for nonbroadcast transmissions in the Privacy of Communications Act. This act provides penalties for the disclosure or use of information that may be intercepted.
- One of the major reasons scanners were not specifically forced to remove cellular frequencies from their capabilities is that the frequency range of 825 to 890 MHz is not allocated just to cellular use. Also be aware that the removal of the frequencies from these devices was on a voluntary basis until the details of this legislation were resolved.
- Having recently watched members of the commercial satellite industry protect their assets byencoding their signals, Congress was probably tempted to let this solution evolve into the cellular industry as well.

Congress long ago deemed the airwaves to be a *public* asset. If an industry wants it for private use, it is that industry's responsibility to provide this capability, but not by restricting public rights.

- Although not mentioned in the article, the liability aspects of cellular phone companies selling complete privacy over these facilities appear to be staggering.
- Although scanner manufacturers and cellular phone companies are mentioned as being affected by the Electronic Communications Privacy Act, no mention was made in the article of the very narrow segment of users that stood to profit from the passage of this legislation.
- Finally, again no mention was made about the fact that this legislation would have long-ranging effects on all other communications services, not just cellular services. This law makes it illegal to listen to any radio communications not specifically intended as broadcast information, unless that broadcast is accidentally encountered.

The ramifications of this law border on the absurd and are the result of a narrow interest group convincing Congress that this loss of another American freedom is in the country's best interest.

This law is virtually unenforceable, except with more money and manpower than all the government agencies combined can provide. Why it was passed is a total mystery to me and many others in the field of business radio.

Charles Kilch
Senior member
Technical staff
Computer Sciences Corp.
Middletown, Ohio

Eavesdropper detection

In his article "Cellular phones: only the illusion of privacy" (*NW*, Aug. 28), Robert Corn-Revere states that "Enforcement in the cellular context isn't very practical since it is impossible to detect someone listening in on a cellular call."

However, it is possible to detect a scanner or other superheterodyne receiver and what it is listening to by proper analysis of the local oscillator energy emanating from the receiver.

Every superheterodyne receiver, be it fixed-tuned, tunable or a scanner, has a local oscillator, the frequency of which is in some way related to the received frequency.

Most, if not all, of these emissions can be detected and measured some distance from the receiver. The receiver antenna and the line cord are the usual escape routes for this energy to exit the receiver.

Detection, measurement, some basic arithmetic and perhaps a little spoofery of the receiver in question are all that would be needed to define the location and received frequency of any superheterodyne receiver.

A number of firms manufacture receivers intended to locate threat emitters, either in a battlefield or a counterintelligence scenario. Such receivers come equipped with a directional antenna, sophisticated receiver, built-in CRT display and a computer interface. Their basic intent is to quantify frequency, direction and intensity of the radio frequency environment in the immediate vicinity. The directional antenna can be pinpointed in one particular direction — at a house, for example. The receiver can be programmed to accept or ignore any frequency within its range. The CRT display can be used in a number of modes, such as spectrum/signature analysis or analysis of any recovered audio that might be modulating the local oscillator.

A personal computer could be used to control the entire system. An accurate signal generator and a buffer amplifier would be handy to "spoof" the receiver under observation into responding, which would perturb the local oscillator in a way that is detectable to the monitor receiver. The design of some scenarios is such that a small amount of the received audio modulates the local oscillator, which can be recovered by the monitor.

Historically, this method has been used as far back as World War II by submarines to locate potential victim shipping. The British counterintelligence forces were able to locate Russian receivers throughout the 1950s and '60s, and the method was extended in Great Britain to locate unlicensed TV receivers.

In this country, a firm in California had a setup that would detect and expose to prosecution people engaged in stealing microwave feeds from the cable companies.

I have heard of, but not yet seen, a radar detector that works on this principle.

So it is possible to detect someone listening in on cellular calls.

N.E. Litsche
President
Air Navigation Industries, Inc.
Canandaigua, N.Y.

NETWORK WORLD

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"Yes."

Audit Bureau of Circulations

AT&T files Tariff 16 plan for state of Pennsylvania

Custom net deal worth up to $2 million annually.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — AT&T added to its custom network offerings for government users last week when it filed a Tariff 16 plan for the Commonwealth of Pennsylvania, the fourth Tariff 16 filed to date.

Under the three-year deal, Pennsylvania will add switched outbound interstate service to its existing private network. AT&T, which has guaranteed not to raise prices during the life of the contract, said in its filing that it expects the network to be worth about $2 million annually.

Tariff 16 allows AT&T to provide voice and data services under special rates and conditions to state and federal government customers that contract for their network through a competitive bidding process. Corporate customers and government users not purchasing service through a competitive bidding process are not eligible.

AT&T met strong opposition from rival carriers and trade last year when it filed its initial Tariff 16 offering to provide the Department of Defense with an outbound calling service for military bases in Hawaii. The second Tariff 16 was filed for AT&T's 60% stake of the Federal Telecommunications System 2000 network.

AT&T met strong opposition from rival carriers when it filed its initial Tariff 16 offering.

▲▲▲

Software-Defined Network

AT&T's third offering under the tariff, which has been delayed by regulators, would provide a customized Software-Defined Network for outbound calling to the Michigan Collegiate Telecommunication Association. State universities and offices in Michigan would be able to set up a joint virtual network, aggregate their traffic and qualify for volume discounts.

The Pennsylvania deal will provide outbound calling from five AT&T central offices in the state — Harrisburg, Philadelphia, Pittsburgh, Scranton and State College — to locations in the U.S., Puerto Rico, the U.S. Virgin Islands and other international locations. Calls must be dialed directly, however, so offerings such as calling card, person-to-person and collect services and calls to 800 and 900 numbers are not included.

User sites will access the outbound network through dedicated access, which will be priced at regular tariffed rates. The customer may purchase access from either AT&T or other carriers.

Rates vary according to distance and time of day. The range of prices per minute during business hours are: 3.8 cents for a 50-mile call; 5.2 cents for a 500-mile call; and 6.4 cents for a 5,000-mile call.

IBM's new release of RACF bows

continued from page 4

1.3, or VM/System Product/High Performance Option Release 6 to support RACF 1.9. The software is expected to be available in November 1990 for a monthly license fee of $927.

The new Transaction Security System products announced last week will be marketed to companies in financial, aerospace and other industries where business-to-business communications is commonplace, Gilbert said.

The products include data encryption adapters for IBM's Personal System/2s that support the Data Encryption Standard as well as a number of personal identification devices designed to restrict microcomputer access to the network.

The IBM 4753 Network Security Processor is a Personal System/2 that can be channel-attached to System/370 mainframes running MVS. The microcomputer, which is driven by the MVS Support Program on the mainframe, houses an IBM 4755 Cryptographic Adapter.

Remote Personal System/2s outfitted with the same adapters can send encrypted messages to the mainframe. The messages are then routed through the Security Processor for decryption.

To control access to Personal System/2s outfitted with the 4755 adapters, IBM introduced the 4754 Security Interface Unit. The device has a 12-digit keypad for entering personal identification numbers and a slot for the IBM Personal Security card, a credit card-like device programmed with cryptographic functions and the user's access privileges.

The card can also store identification data for the newly released biometric pen, which gives the Transaction Security System a signature verification feature.

People who will be identified by their signature use the pen to enter five signature samples. The unit measures biometric parameters, such as the user's pressure and writing speed, and then stores a digital image of the signature.

That digital image is used as the standard to measure future signatures. A forger with an exact signature could not gain access to a network, the company said, because the system would detect differences in the measurements of the signature dynamics.

The 4753 Network Security Processor and the MVS Support Program is expected to be available on March 30, 1990, and will cost $32,675 and $8,090, respectively.

Scheduled for availability on Jan. 26, 1990, the 4755 Cryptographic Adapter will cost $1,115, the 4754 Security Interface Unit will cost $1,035 and the biometric pen will cost $1,205. The IBM Personal Security card is free of charge and comes with the Security Interface Unit.

The new antivirus lab is intended to help IBM develop prototype tools, which the company will use to protect itself against viruses. The lab will not develop commercial antivirus products.

"Our concern is to protect ourselves first because we've got to be careful that we don't ship anything nasty to our customers," Gilbert said.

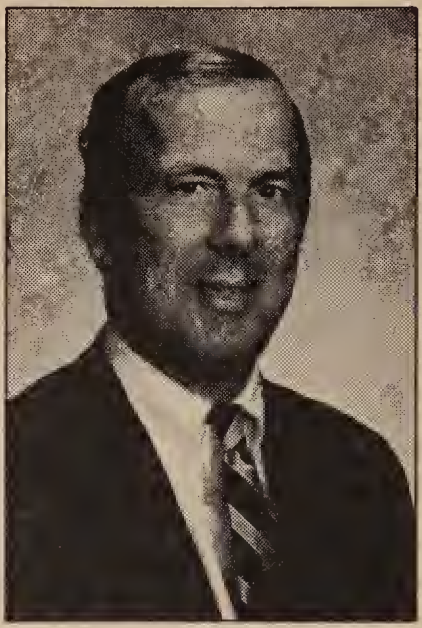
Virus studies conducted by the lab will help the company build security into its products, he added.

Infomart net links systems

continued from page 4

The 6,000-sq.-ft. exhibit is segmented into physician offices, emergency rooms, admitting areas, patient rooms, critical care units, radiology departments, operating rooms and administrative offices.

Each area will contain advanced health care technology products and medical technology systems supplied by about 24 leading vendors, including Apple Computer, Inc., Hewlett-Packard Co. and Simborg Systems Corp. Information systems in the cells will be linked together in a local network to allow cells to share patient information.



Jay Toole

Some of the offices and rooms will be linked using HL-7 protocols, while others will be supported using other protocols, including ISDN. Andersen Consulting will use several gateways to interconnect disparate networks in the exhibit, Toole said.

HL-7 will be implemented to link information systems supporting nursing, critical care, medical records and bedside care.

Network management software from Simborg Systems will be used to manage communications on the network and maintain the integrity of application data, Toole said. Andersen Consulting will build custom interfaces for vendor products that are not compatible with HL-7 or other protocols used in the exhibit.

HL-7 is an application-level protocol that is gradually emerging as a communications standard in the health care industry. It borrows elements from several proprietary and standards-based protocols already used in the industry and runs on top of lower level standards such as Ethernet and Transmission Control Protocol/Internet Protocol.

ISDN will likely be used to link information systems in other rooms in the demonstration, such as the physician's office, patient administration and radiology, Toole said. ISDN will enable Andersen Consulting to transmit radiological images and voice over phone lines to the physician's cell.

The Basic Rate Interface provides two digital 64K bit/sec B channels for voice or data and one 16K bit/sec D channel for signaling.

Users applaud exhibit

Users who have been briefed on the proposed exhibit were generally enthusiastic.

"The biggest value of this exhibit is that it will educate users who know nothing about HL-7, Simborg and distributed processing and how it all works together in a hospital environment," said Stan Prorock, corporate information network manager at Scottsdale Memorial Hospital in Scottsdale, Ariz.

Other users said the exhibit will help them plan for future technologies and learn more about how HL-7 interacts with all layers of the Open Systems Interconnection model.

Prorock said he supports the concept of distributed processing using HL-7 protocols, but he cautioned that the exhibit might elevate the expectations of senior executives.

The Dallas Infomart

"Senior executives will be mind-boggled when they see all that advanced technology running together on a network," Prorock said. "Unfortunately, the exhibit is an ideal environment that doesn't exist at most hospitals. Network managers would be hard pressed if they were told to duplicate the same kind of connectivity the exhibit is going to demonstrate."

NETWORK WORLD

Data switches

Vendor	Product	Maximum user side ports/ data rate	User port interfaces supported	Maximum number of net side ports	Flow control supported	X.25 user port available	Local networks supported on user ports	Toggling between sessions supported	Protocol conversions available	Redundant equipment	Price range
Micom Communications Corp. Simi Valley, Calif. (805) 583-8600	Instanet Series 40	2,036/19.2K bit/sec	RS-232, RS-422, V.35	2,036 per node	Request to send/Clear to send, Xon/Xoff, custom	Yes	Local Access Transport, TCP/IP, Ethernet	Yes; 8	Asynchronous, X.25, TCP/IP, IBM 3270, SNA/BSC	Power, logic, bus	$5,000; depends on configuration

Correction: Our recent data switch buyer's guide, "A switch in time" (*NW*, Oct. 2), omitted the above listing because Micom did not provide product information by press time.

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DEC nudges into IBM mart

continued from page 2

duced in the early 1970s. Slow sales forced DEC to discontinue the systems in the early 1980s.

The company hopes to be able to do better this time around due to the wide user acceptance of its DECnet architecture. The VAX 9000, which rivals the power of a low-end IBM 3090, will be able to communicate as a peer with other VAXes on existing DECnets and also support client/server applications.

For example, the VAX 9000 will be able to act as a server managing access to a centralized data base for smaller VAXes running data base applications.

In addition, DEC is developing extensions to the Network Computing System of Hewlett-Packard Co.'s Apollo Division. These extensions will enable users to create applications that let smaller VAXes parcel out computation-intensive tasks to the VAX mainframe.

The VAX 9000, which will run an enhanced version of DEC's VMS operating system, comes in five models ranging in price from $1.2 million to $3.9 million.

Two models, the 210 and 410, support a single processsor. The Model 420 comes in a dual-processor configuration, the Model 430 supports three processors, and the Model 440 has four processors. Each model supports up to 512M bytes of memory. DEC said it will expand VAX 9000 memory to 2G bytes in the future.

According to the company, the VAX 9000 line is 30 to 117 times more powerful than a VAX 11/780, the first VAX processor. Gartner Group, Inc., a market research company in Stamford, Conn., says the VAX 9000 is up to 4½ times more powerful than the previous high end of the VAX line, the VAX 6000.

DEC is hoping customers reaching the capacity limits of their VAXes will look to the VAX 9000 instead of IBM mainframes; analysts agreed.

"It's an upgrade for DEC's existing base, first and foremost," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C. "There is a lot of demand in DEC's base for more horsepower."

To integrate the 9000 into DECnet, the company announced an enhanced Ethernet controller for the machine's XMI bus. The DEC LANcontroller 400 Adapter has up to 512K bytes of on-board memory to buffer communications between the 80M byte/sec XMI bus and 10M bit/sec Ethernets.

> The VAX 9000 line is 30 to 117 times more powerful than a VAX 11/780, DEC said.
>
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The Model 210 can support as many as four LANcontroller 400s, each of which supports a single Ethernet port. Models 410 and 420 support as many as eight adapters, while Models 430 and 440 support up to 16 adapters. Each LANcontroller 400 costs $7,000.

"The VAX 9000s are [likely] to support hundreds, and probably thousands, of DECnet LAN-connected users," said Peter Kastner, vice-president of the Aberdeen Group, Inc., a Boston-based market research and consulting firm.

The Ethernet/DECnet support and retention of the VMS operating system, which is common to all VAXes, enables DEC to continue preaching its distributed peer-to-peer networking strategy while IBM and other mainframe vendors are saddled with hierarchical network architectures.

Peer-to-peer networking enables any computer on the network to easily communicate with any other computer, while hierarchical networks rely on processors at the top of a hierarchy to establish communications sessions between any two network nodes, Dzubeck said.

In addition, a VAX 9000 in a peer-to-peer DECnet does not require the traditional mainframe front-end processor. This is one of the reasons DECnet is easier to install and maintain than hierarchical Systems Network Architecture nets, Kastner said.

With DECnet, a VAX 9000 can be added to the network without having to rewrite network routing tables. But with SNA, each time users or mainframes are added to the network, the routing tables stored on IBM front-end processors must be updated.

"That is one reason why DEC has already been competing with IBM for the last five years," Kastner said. "And I think you would have to say that part of the reason DEC grew to a $12-billion-a-year company was by having better solutions than IBM and the rest of the market. Networking has been very important to that [growth]."

Terry Shannon, an analyst with the Framingham, Mass.-based market research firm International Data Corp., agreed. "To own the account, you have to own the network. DEC knows that just as well as IBM [does]."

Users reexamine disaster strategy

continued from page 2

John Parady, executive vice-president of technical services at the Pacific Stock Exchange, said he learned that the exchange must do a better job of supplying its data center here and in Los Angeles with redundant copies of trading data.

All telephone service and computing support at the exchange's Bay Area trading floor was disrupted for nearly two days by power outages ("Quake wreaks havoc on Calif. net users," *NW*, Oct. 23).

Network emergency plans had called for the Pacific Stock Exchange to use its Los Angeles data center to handle some of the trade processing chores usually handled by the data center here.

In practice, however, the exchange found that it couldn't switch data processing chores over in time to meet pressing trade settlement deadlines, largely because full copies of important trading data and software were not maintained at the Los Angeles site.

Of particular importance were records of options trades made on Tuesday, which still had not been settled when the earthquake struck at 5:04 p.m. PST. The exchange needed to match records of buyers with sellers and send them via network links to trade settlement authorities by 3 a.m. Wednesday in order for traders to get confirmation that their transactions had gone through, Parady said.

Pacific Stock Exchange employees solved the dilemma by walking the trade data and trade-clearing software to a nearby Charles Schwab Corp. data center, which was running on auxiliary power. Records of settled trades were sent to the clearing authorities 10 minutes before deadline.

The biggest lesson George Conniff learned is that his firm needs to find a better location for its data center. Conniff is manager of information services at Bechtel Group, Inc., based here.

Fears that the 69-year-old building housing Bechtel's data center might collapse caused the company to institute a full disaster recovery program.

Bechtel evacuated its data center and let its equipment there run DP and network chores largely unattended. Company employees flew to Philadelphia and loaded an IBM mainframe supplied by SunGard with vital data and software.

The engineering firm worked with Pacific Bell engineers to move to its nearby headquarters consoles and terminals monitoring the network and computer gear, which were patched to the abandoned facility via net links.

"One thing I've learned is that you've really got to pay attention to where your main [data and network] center is located," Conniff said. "It's something that you don't always think about but that can come back to haunt you."

Senior Editor Bob Brown contributed to this article.

FCC won't prohibit AT&T deals

continued from page 1

WTG claiming that the agency had failed to consider legal issues, such as Tariff 12 pricing differences and the allegation that AT&T was bundling equipment with services.

Not a blank check

Although the FCC refused to modify its earlier ruling, it emphasized that Tariff 12 is not a blank check and it will scrutinize future Tariff 12 deals to make sure that all firms willing to commit to the same terms and conditions will get comparable deals.

IDCMA issued a strongly worded statement saying the FCC decision was "a radical departure" from its rules prohibiting discrimination among customers purchasing the same service.

IDCMA claims that Tariff 12 reduces competition because AT&T fails to divulge all information on the terms and conditions of its offers, making it impossible for systems integrators to offer competing deals.

MCI Communications Corp., which along with IDCMA, WTG and US Sprint Communications Co. have taken the FCC to court over its decision endorsing Tariff 12, also issued a statement criticizing the FCC's decision. MCI claims that Tariff 12 is a convenient vehicle for AT&T to single out some customers for discounted services.

Tariff 15 ruling

On the Tariff 15 front, AT&T won a less substantial endorsement from the FCC but for now will be able to continue filing Tariff 15 deals.

AT&T's only customer for Tariff 15 until last week was Holiday Corp. According to AT&T, that plan, which offered discounts of up to 10% off AT&T's tariffed Pro America II rates, was filed in response to a similar below-tariff offer from MCI.

The FCC ruled last week that the specific plan filed for Holiday Corp. was illegal but did not find the concept of offering customer-specific prices illegal. This means AT&T is free to file new Tariff 15 network deals. In fact, three days before the FCC hearing, AT&T filed a second Tariff 15 deal for Indianapolis-based Resort Condominiums International, Inc.

The offering for Holiday Corp. was declared illegal only because the circumstances surrounding the original deal had changed.

The main legal question — whether any carrier should be allowed to offer prices targeted at only one customer — was made moot when MCI said during the Holiday investigation that it would make similar deals to customers that could commit to the same terms and conditions. AT&T's Holiday offer, therefore, could no longer be justified as a response to a customer-specific deal from MCI, the FCC said.

The larger question of whether single-customer offerings are legal will be taken up as part of an FCC proceeding examining AT&T's status as the dominant carrier in the marketplace, according to Richard Firestone, chief of the Common Carrier Bureau at the FCC. That proceeding could lead to decreased regulation for AT&T and a possible relaxation of requirements to file tariffs.

Such a proceeding will likely take many months and until that proceeding is finished, AT&T is free to proceed with Tariff 15 offers.

"We will continue to file Tariff 15s whenever we find any of the interexchange carriers putting a customer-specific bid in the market," Nacchio said.

Uphill battle

Nacchio claimed that there are instances where AT&T's competitors are offering such deeply discounted deals that AT&T can't compete, even with other tariff offerings, such as Tariff 12, promotional tariffs and general across-the-board rate reductions.

Although AT&T is pleased it can continue with Tariff 15, Nacchio complained that AT&T is still at a disadvantage. "I have to essentially police the industry, which I always thought was the responsibility of the [FCC's Common Carrier] Bureau," he said.

> "We will file Tariff 15s whenever we find interexchange carriers putting a customer-specific bid in the market," Nacchio said.
>
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Nacchio said he thought it was absurd that AT&T has to find customers receiving off-tariff deals, get a copy of the competitor's bid and submit an affidavit in order to offer a Tariff 15 deal.

Because of the regulatory process, "a lot of customers shy away from [Tariff 15] . . . We shouldn't have to say that to do business with AT&T, you have to get your legal staff involved," Nacchio said.

But Jim Bauerle, director of office automation at Resort Condominiums International, which will have to wait several more weeks to see if the FCC will let its Tariff 15 offer go into effect, said he was not concerned about the possible legal problems.

"We're concerned only to the extent that [Tariff 15] may be found illegal and then we're back to ground zero," he said. Resort Condominiums International is currently an AT&T customer.

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IBM makes pitch for factory nets

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company in Boston.

"There is a strong synergy between IBM's office, engineering and manufacturing environments that didn't exist just months before," Belton added. "That is extremely big news."

The integration of IBM's various systems via a common data repository is key if IBM hopes to catch up with Digital Equipment Corp., a stalwart in the manufacturing markets that has provided such integration for some time.

Key to this effort are new tools for configuring factory automation systems and developing factory floor applications. The primary systems enabler in the CIM Architecture is the CIM Communications and Data Facility, which provides a common engineering and manufacturing data base based on IBM's DB2 and SQL.

The CIM Architecture joins IBM's recently announced Distributed Automation Edition (DAE) tool, which helps users configure net communications between various IBM and non-IBM systems on the factory floor.

The CIM tools were bolstered with the introduction last week of PlantWorks, an OS/2-based application development program that makes it possible for nonprogrammers to build applications for monitoring and controlling diverse plant floor equipment. PlantWorks uses the DAE communications facilities.

The MAP 3.0 products, which did not receive major billing by IBM and do not include "MAP" in their names, consist of Open Systems Interconnection/MMS for VM and OSI/MMS for OS/2.

MMS is the standard that defines the communications services and facilities that MAP applications employ.

IBM said these products enable users to develop MAP 3.0-compliant applications that run in the VM and OS/2 environments. MMS support will allow the applications to exchange data with non-IBM devices in real time. Support for those environments could satisfy MAP proponents who had previously criticized IBM for not supporting MAP applications on its Personal System/2 and high-end systems.

Michael Kaminski, manager of CIM networking on General Motors Corp.'s advanced engineering staff and an outspoken MAP proponent, said he was "elated by the fact that the big guys are coming out with the stuff we've been screaming for all along." (DEC made a MAP 3.0 announcement the previous week.)

"VM and OS/2 are not exactly the operating systems we are looking for — we'd rather have Unix-based MAP products — but [IBM is] coming along," Kaminski said. "To the best of my knowledge, they are working on putting MAP on all their systems."

Kaminski said he would reserve further comment until he had time to review the announcements thoroughly. Belton, who has already received an extensive briefing by IBM, says he doesn't think Kaminski will be pleased.

"For people looking for a strong statement about IBM putting standards first, this is going to be a big disappointment," Belton said. "While IBM is starting to talk about interoperability among vendors, it is clearly putting its own stuff first. And most manufacturing sites in the U.S. are heterogeneous computing environments."

A key component of networking hardware introduced as part of the CIM announcement is the 3172 Interconnect Controller, a microcomputer based on IBM's Micro Channel Architecture and a 25-MHz Intel Corp. 80386 processor. It provides channel attachment of local networks to System/370 host processors running MVS, VM or AIX.

The 3172 supports token-ring or MAP 3.0 networks, or Ethernets running Transmission Control Protocol/Internet Protocol. The adapters that enable the 3172 to accommodate these networks are available from IBM.

The 3172 is essentially a higher end version of IBM's 8232 LAN Channel Station, an IBM Personal Computer AT with an 8-MHz 80286 processor. The 3172 is much faster and more flexible than the 8232. The 3172 connects up to four local nets to a single mainframe channel.

Another important difference is that it is "100% shipped and supported by IBM," said Margo Shrack, a product marketing manager for Interlink Computer Sciences, Inc. of Fremont, Calif., which provides gateway software that turns the 8232 into a gateway between Systems Network Architecture and DECnet. Interlink will be upgrading the software to support the 3172.

Brokerages opt for MCI net

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traffic to AT&T points of presence (POP), McDade said.

The company reaps greater volume discounts by integrating 100% of its incoming and outgoing voice traffic on dedicated T-1 lines to MCI's POPs, he added. McDade said Stuart-James will save about 40% on its data expenses by migrating traffic from dedicated 9.6K bit/sec circuits to these same T-1s.

Both firms also purchased MCI's Network Information Management System, a personal computer-based system that lets users tap into MCI's data bases via dedicated 9.6K bit/sec links to access Vnet performance data.

Foot dragging at the FCC

According to Ray McDade, Stuart-James' director of communications, the Federal Communications Commission's inability to make a quick decision on the fate of Tariff 12 was a major reason for rejecting AT&T's proposal.

"AT&T said they couldn't go ahead [and build the network it bid] until the FCC made a decision on Tariff 12, which at the time appeared three to four months down the road," McDade said. The brokerage firm awarded MCI the contract about two months ago and is only now finishing installation of the network.

McDade said Stuart-James expected to save about $100,000 per month in communications expenses, or about 18% off its existing bill, by getting more attractive pricing from its carriers. He said his firm did not want to forgo these savings while waiting for a Tariff 12 decision.

"We'd have missed out on about $300,000," McDade said. He added that the uncertainty was increased when AT&T offered his firm free channel banks for each of its offices and then withdrew the offer when the FCC ruled that AT&T could not bundle equipment with services.

Gerard Higgins, senior vice-president for data processing and communications at Drexel Burnham Lambert, said he also was concerned about the muddy legal waters regarding Tariff 12. He added, however, that MCI won the contract primarily on costs and service.

"They offerred us more attractive terms [than AT&T], the service was good, and Vnet is state-of-the-art technology," he said.

According to Higgins, the aggressive pricing offered by MCI will cut his firm's voice expenditures approximately in half over the length of the contract.

Reshaping the RFP

In order to negotiate these kinds of savings, Higgins said his brokerage firm radically reshaped its initial requests for proposal. When the company began soliciting bids last winter, it sought volume discounts by purchasing all of the voice and data services from a single vendor in just one custom net contract.

But Higgins said the brokerage learned by going through the process that bulking services into a single contract can often lead to overstated savings.

"The vendors tend to inflate the base [estimates of a user's existing network expenses] and offer you a discount off the inflated base so they retain as much revenue as possible," he explained.

Drexel Burnham Lambert decided to limit this risk by splitting its contract in two. The brokerage put most of its voice services into the contract that was awarded to MCI and put all of its leased-line services into another contract, which has not been awarded yet.

NCR to unveil Tower NetWare

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would make it the first implementation of Portable NetWare to reach users.

Besides providing a way to integrate diverse operating system environments, Tower NetWare will enable existing NetWare users to employ Tower supermicrocomputers as back-end servers for specialized data base application processes.

Seven software vendors, including Informix Software, Inc., Oracle Corp., Relational Technology, Inc. (RTI) and WordPerfect Corp., have committed to developing data base management and office automation applications for NCR Tower NetWare, as well as gateways and network management software.

"This is an excellent way for Novell to prove its critics wrong about NetWare being a proprietary network operating system environment," said Doug Gold, manager of communications industry research at International Data Corp., a market research firm in Framingham, Mass. "With the release of Tower NetWare, NCR and Novell have given users a product that delivers on the promise of Portable NetWare."

NCR's Lynch and Novell officials confirmed tomorrow's announcement of NCR Tower NetWare but refused to elaborate.

However, at the initial Portable NetWare announcement last March, Timothy Davis, NCR's assistant vice-president of networked systems, disclosed some details regarding Tower NetWare ("Novell to disclose partners for Unix-based NetWare," *NW,* Feb. 20). Davis said his company would market two interoperable versions of Tower NetWare. One version will run as an application under Unix in a NetWare server. The second will run stand-alone in a Tower supermicrocomputer, positioning it as a file server.

Tower NetWare will run on Unix-based computers based on Motorola Corp.'s 68000 microprocessor. According to analysts, the Tower supermicrocomputers will be capable of supporting a larger number of users and process file storage and retrieval requests faster than existing NetWare 80286- and 80386-based servers.

A high-end configuration would support more than 250 users.

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NCR Tower NetWare will run on all six members of the Tower supermicrocomputer line, analysts said. The low-end Tower 32/200 is equivalent to an 80386-based machine and is capable of supporting about 25 users when configured as a nondedicated server, Lynch said.

The high-end Tower 32/850 has the equivalent processing and throughput power of the top-of-the-line IBM Application System/400 minicomputer, Lynch claimed. It will give NetWare users about eight times faster processing and throughput than a server running NetWare 386. A high-end configuration would support more than 250 users — the number currently supported on NetWare 386 servers.

Of the software developers supporting NCR Tower NetWare, Oracle, RTI and Informix will develop data base management software.

DEC to become net contractor

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adopt, Chase said. "Kodak will focus on the *what*'s: what product, what service, what quality, at what price, over what period of time," Chase said. "*How* that gets done, including the selection of a particular vendor or carrier, will not be our primary concern."

About 300 Eastman Kodak employees who worked in network operations will be offered positions with DEC as a result of the deal, Chase said.

Chase stressed that Eastman Kodak is not farming out total control of its network operations but intends to work closely with DEC. For example, the agreement will create an operations review committee comprising staff from both firms that will foster the exchange of ideas and information about ways to improve the net.

DEC was one of six companies that bid on the contract. Eastman Kodak officials declined to disclose the names of other bidders, although it was widely believed that IBM was a leading contender after it won the data processing contract this summer.

"DEC did a better job of matching our interests," Chase said, but he declined to elaborate.

Eastman Kodak has 20 major IBM Systems Network Architecture networks, six of which are located here. The networks link tens of thousands of personal computers, minicomputers, workstations and process control computers.

Eastman Kodak used four criteria to judge the merits of forming a partnership: potential cost savings; impact on customer service; impact on the work environment at Eastman Kodak; and how it positions the company for the future.

Chase said the deal would result in significant cost savings, but he would not be more specific. "The move makes good business sense," he said. "Otherwise, we wouldn't do it."

A few suggestions for those who decide to go with another international long distance company.

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